This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

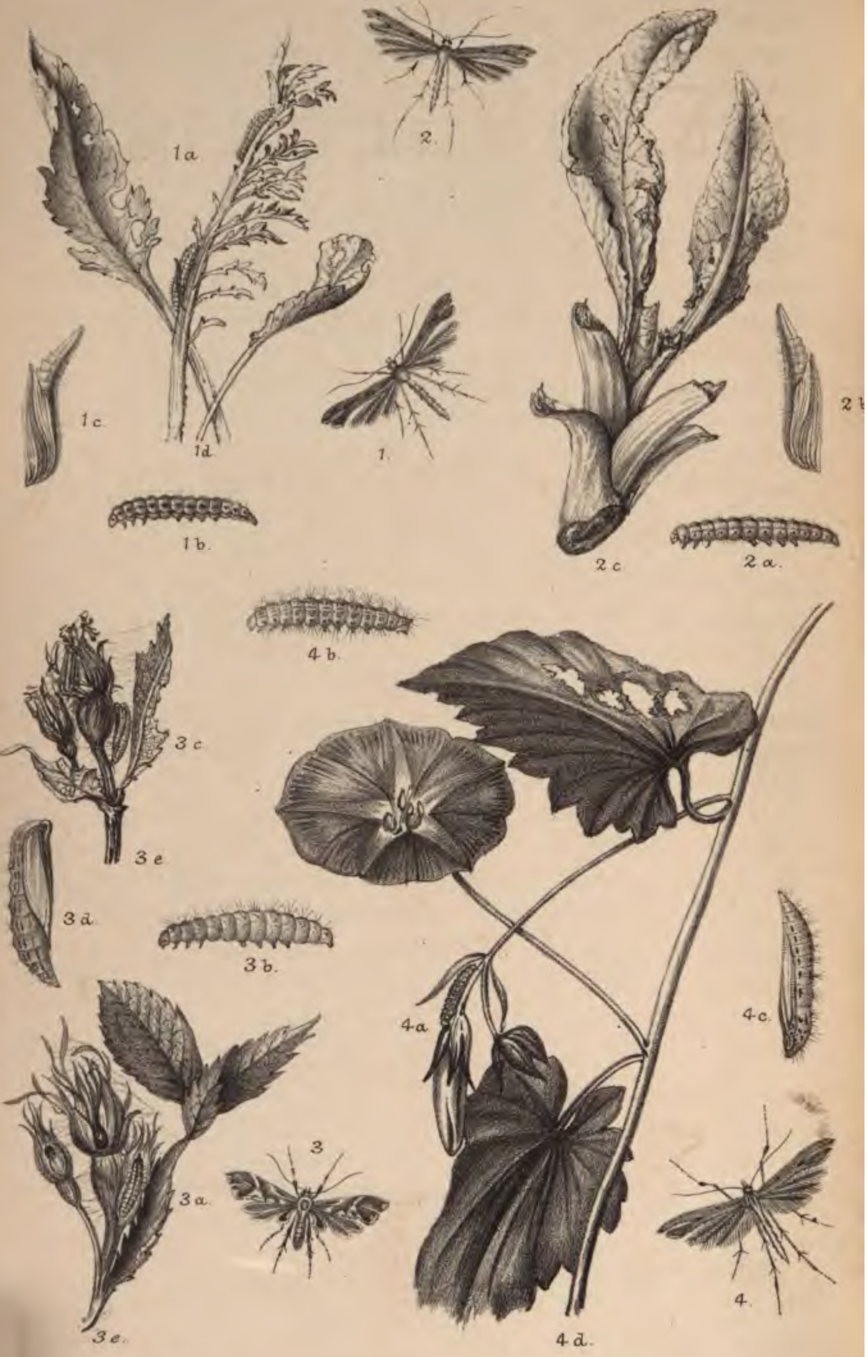
About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Mr. Robert F. Pitts,

Copt Hall,
Springfield,
Chelmsford.

Entomologist, November 1885. Plate 1.



West Newman & C° del. ad nat. et li

THE

ENTOMOLOGIST

AN

ILLUSTRATED JOURNAL

OF

GENERAL ENTOMOLOGY.

EDITED BY JOHN T. CARRINGTON, F.L.S.

WITH THE ASSISTANCE OF

FREDERICK BOND, F.Z.S., F.E.S.
EDWARD A. FITCH, F.L.S., F.E.S.
JOHN A. POWER, M.D., F.E.S.
J. JENNER WEIR, F.L.S., F.Z.S.
F. BUCHANAN WHITE, M.D., F.L.S., F.E.S.

> "By mutual confidence and mutual aid
> Great deeds are done and great discoveries made."
> POPE'S '*Homer.*'

VOLUME THE EIGHTEENTH.

LONDON:
SIMPKIN, MARSHALL, & CO., STATIONERS' HALL COURT.

1885.

131745

"But who can paint
Like Nature? Can imagination boast
Amid its gay creation, hues like her's?
Or can it mix them with that matchless skill,
And lose them in each other?"

WILLIAM THOMSON.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

Adye, J. Mortimer, 262, 293, 301
Anderson, Ernest, 327
Anderson, Joseph, 241
Anderson, Joseph, jun., 43, 173, 242, 243, 258, 302, 324, 327
Anderson, R. J., 290
Atmore, Edward A., 167, 172

Bailey, G., 316
Balding, George, 41, 122
Barclay, F. H., 24, 261
Barnard, George, 160, 248
Belt, A., 293
Benson, Henry, 261
Bignell, G. C., F.E.S., 152, 247, 248, 286, 303, 326, 327
Bishop, E. B., 74, 242
Blaber, W. H., 168, 263, 297, 303, 316
Blandford, W. F., 294
Blandford, W. F. H., 128
Boden, C. J., 317
Bone, G. H. K., 263
Borer, James, 165
Bostock, F., jun., 259
Bridgman, J. B., F.L.S., F.E.S., 13, 100, 205
Briggs, Charles A., F.E.S., 129
Bright, P. M., 78, 79, 303
Brooks, W., 290, 297

Cambridge, Rev. O. Pickard, F.L.S., 249
Capron, E., M.D., F.E.S., 220
Carrington, John T., F.L.S., 79, 108, 139, 149, 167, 175, 187, 198, 199, 293, 303, 328
Cave-Browne, Rev. S., 260
Chittenden, D., 262
Chitty, Herbert, 46, 76
Clifford, J. R. S., 21, 22, 51, 147, 254, 293, 301, 315, 325
Cockerell, T. D. A., 20, 56, 74, 120, 127, 246, 300
Cook, A. C., 259
Cooke, Edward, 125
Cooper, Bernard, 217
Cooper, J. A., 243, 245, 246, 294
Cordeaux, John, 267
Coste, F. H. P., 293, 317
Coverdale, George, F.E.S., 48, 112 125, 152, 183, 218, 225
Crallan, G. E., 262
Cregoe, J. P., 294
Cross, Mrs. Elizabeth, 22

Dale, C. W., F.E.S., 73
Distant, W. L., F.E.S., 146, 289
Druitt, A., 258
Dunning, J. W., M.A., F.L.S., F.Z.S., F.E.S., 73

Edgell, Dover C., 316
Ellison, S. T., 245
Elstowe, George V., 201

Fanshawe, Lyonell, 65, 136, 190
Farren, W., 74
Fitch, Edward A., F.L.S., F.E.S., 13, 100, 205, 299, 300
Fowler, Rev. W. W., M.A., F.L.S., F.E.S., 151
Fox, N. P., 241
Freer, R., 121
Frohawk, F. W., 257, 302

Gardner, Edmund, 266, 267
Gardner, J., 166, 218
Goldthwaite, Oliver C., 131, 260, 261
Goss, Herbert, F.L.S., F.G.S., F.E.S., 122, 196, 313
Grapes, Geo. G., 253
Gregson, C. S., 52, 118, 150, 165

Hall, C. G., 148
Harding, Martin J., 51, 147
Harker, Geo. A., 262
Harrison, J., 244
Hawes, F. W., 265, 282
Hill, Lewis F., F.E.S., 241
Hill, Thomas, 73, 193
Hodgkinson, J. B., 54, 76, 122, 266, 322
Hudson, George Vernon, 30, 153, 168
Hunt, C. B. Holman, 324

Inchbald, Peter, F.L.S., F.E.S., 36, 124, 311

Jager, J., 317

Jefferys, T. B., 121, 150, 244, 316
Jenkin, Alfred H., 121, 291
Jones, A. H., 293
Joy, Ernest, 241

Kane, W. F. de V., M.A., M.R.I.A, F.E.S., 45
Kay, R., 295
Kerr, W. J., 262
Kerry, F., 258, 261
King, T. W., 262

Lang, Henry C., M.D., F.L.S., F.E.S., 50
Lansdell, Rev. Dr. Henry, 247
Lewcock, G. A., 24
Livett, H. W., M.D., 51, 77
Lloyd, A., F.C.S., F.E.S., 302
Lowe, Rev. Frank E., 217
Ludgrove, Thomas, 124

Machin, William, 55, 169, 173, 245, 246, 264, 301
Macmillan, W., 243, 260
McRae, W., 294, 296, 298
Marriott, F. F., 299
Mathew, Gervase F., R.N., F.L.S., F.Z.S., 295
Meldola, R., F.R.A.S., F.C.S., F.E.S., 294
Miller, H., jun., 262
Mitchell, Alfred T., 319
Mutch, J. P., 259

Nash, W. G., 243
Nicholson, William E., 261, 307
Norris, Herbert E., 258, 303
Nowers, J. E., 317

Pearce, W. A., 268
Pegler, Stephen, 121, 127, 293
Porritt, G. T., F.L.S., F.E.S., 53, 194, 264, 300
Potter, Joseph, 318

Ramsden, Hildebrand, M.A., F.L.S., F E.S., 10
Raynor, Rev. Gilbert H., 23, 51, 194, 243, 315

Rendall, Percy, 22, 218
Riding, W. S., B.A., M.D., 1, 287
Robinson, A., 299
Rose, Arthur J., 131

Sabine, E., 48
St. John, Rev. J. Seymour, 116, 257, 258, 263, 292
Sandford, Harry C., 123, 192, 321
Sang, J., 21
Sharp, H., 77, 316, 323, 324
Sheldon, W. G., 315, 318, 323
Sims, G. E., jun., 220
Sladen, Rev. C. A., 300, 323
Sotheby, R. M., 55
South, Richard, F.E.S., 3, 11, 96, 171, 195, 273
Stack, E., 213
Swinton, A. H., F.E.S., 21

Tero, C. K., 194
Thornewill, Rev. Charles F., 167
Tite, George H., 241
Tomlinson, J. W., 257
Trimen, Roland, F.R.S., F.L.S., F.E.S., 25, 57
Tristram, W., 259
Tutt, J. W., 54, 70, 75, 94, 122, 169, 188, 195, 218

Vaughan, Howard, F.E.S., 229
Venables, J., 260

Walker, Rev. F. A., D.D.. F.L.S., F.E.S., 6, 39, 91
Walsingham, Rt. Hon. Lord, M.A., F.L.S., F.Z.S., F.E.S., &c., 81
Warren, W., 126
Webb, H. J., 174
Weir, J. Jenner, F.L.S., F.Z.S., F.E.S., 81, 291, 305
Wellman, J. R., 294
White, F. Buchanan, M.D., F.L.S., F.E.S., 21
Whittle, F. G., 244
Williams, James Trimmer, 260
Wood, Theodore, F.E.S., 261
Woodbridge, Francis C., 162, 259, 299
Wright, W. H., 88

ALPHABETICAL LIST OF SUBJECTS.

Abbott's Wood, notes from, 265
Absyrtus, 15
Acherontia atropos, abundance of, in Kent, 72; at Chichester, 243; in Somerset, 243; at Harwich, 258; in Huntingdonshire, 258; larva, 295; at sea, 295; larva producing sound, 301; at Burton-on-Trent, 317
Acidalia virgularia, double-brooded, 51
Aciptilia tetradactyla, 99
Acronycta alni, 194; at sugar, 218; strigosa in Cambridgeshire, 128
Agdistes bennettii in Norfolk, 172
Agrotidæ, on the identity of certain, 148, 149, 165, 166, 167, 188
Agrotis, on the genus, 94; præcox near Cambridge, 262

Amblyptilia acanthodactyla, 97; cosmodactyla, 97
Anacampsis (Gelechia) albipalpella, 245
Angerona prunaria, on breeding varieties of, 253
Anosia archippus in Cornwall, 290; plexippus, 305, in Cornwall, 291
Apanteles glomeratus, 326
Apatura iris in Hampshire, 284
Aphides, their partiality to strongly scented plants, 173; unusual migration, 254; abundance at Peterborough, 267; migration of, 303
Aporophyla nigra in Dorsetshire, 299
Appearance of Lepidoptera, unusual dates, 21, 22, 244, 323
Appias andersoni, n. sp., 146
Apterous sawfly, 247
Arctia mendica feeding on birch, 194
ARGYLLSHIRE—Lepidoptera, 229
Argynnis latona (lathonia) at Brighton, 241; pandora, late appearance of, 21; time of appearance, 50
Argyrolepia mussehliana at Deal, 218
Assam, silk in, 213
Asthena blomeri, 263, 300
Attractions for Lepidoptera, 151

Bankia argentula, larvæ of, 128
BERKSHIRE—Captures in, 266; Thecla pruni, 266; Maidenhead, Ocneria dispar, 243
Bombyx rubi, urtication of larvæ, 324
BOOKS REVIEWED:—
  ‘Russian Central Asia,’ by H. Lansdell, D.D., 174
  ‘Entomologica Americana,’ vol. i., no. 1, 198
  ‘Elementary Text-book of Entomology,’ by W. F. Kirby, 199
  ‘Eighth Report on Injurious Insects,’ by Miss E. A. Ormerod, 221
  ‘Transactions of the Entomological Society of London, 1884,’ 269
  ‘Handbook of European Butterflies,’ by W. F. de Vismes Kane, M.A., 304
Bournemouth, local list of insects, 79
Bryophila algæ, 122; par in Cambridge, 128
Burton-on-Trent and neighbourhood, Lepidoptera of, 177, 208, 231
“By mutual confidence and mutual aid,” 78

Callimorpha hera in Devon, 297, 317
CAMBRIDGESHIRE—Acronycta strigosa, 128; Agrotis præcox, 262; Bryophila par, 128
Campoplex, 15
Casinaria, 103
Catocala fraxini in Hyde Park, 318
Chœrocampa celerio at Retford, 121, 293; at Berkeley, 165; in Surrey, 260; at *Cromer, 261; at Lewes,* 261; at Dovercourt, 259; at Pevensey, 259; at Ramsgate, 261; in London, 261; at Christchurch, 262; at Crosby, 262; in N. Wales, 262; at Holmwood, 262; at Felixstowe, 262; at Ealing, 293; in Essex, 294; at Folkestone, 294; at Bournemouth, 294; in Devonshire, 294; at Plymouth, 294; in Sussex, 275, 316; at Andover, 300; nerii at Hartlepool, 218
Charagia virescens, life-history of, 30
Charops, 100
Choleva spadicea near Nottingham, 124
Cidaria flavicincta, double-brooded, 22
Cleoceris (Epunda) viminalis, 244
Cnæmidophorus rhododactylus, 96; life-history of, 275
Coccyx scopariana, 266
Coleophora artimesiella, 55; bilineatella, 228; saturatella, 229; spartiella, 228; tinctoriella, 225, 228: vibicigerella, 246
Coleophoræ, notes on, 55
Coleoptera, notes on capture and preservation:—I. Apparatus, collecting in winter, 65. II. Killing and preserving, 136. III. Collecting in summer and autumn, 190
Colias edusa, economy of, 21; at Ware, 241; near Lyndhurst and Sevenoaks, 241; at Chichester, 243; plentiful at Frome, 257; near Newark, 257; near Cudham, 257; abundant in North Kent, 293; in North Devon, 293; at Lyme Regis, 294; abundant in Ireland, 322; in Sussex, 316; and C. hyale, 316; helice at Chichester, 258
CORK—Lepidoptera in Co., 123; notes from, 192
CORNWALL—Anosia archippus, 290, plexippus, 291, Deiopeia pulchella, 121, notes from, 287, Polia xanthomista, 287
Crambus alpinellus in Norfolk, 172; myellus in Glen Tilt, 245
Cucullia artemisiæ added to the British fauna, 290; verbasci, abnormal appearance of, 22
Cymodusa, 100

Dasydia obfuscata in Rannoch, 135
Deiopeia pulchella in Cornwall, 121; at Folkestone, 262; in Hampshire, 298
DERBYSHIRE—Lepidoptera, 318
DEVONSHIRE—Callimorpha hera, 297, 317, Chœrocampa celerio, 294; at Plymouth, 294; North, Colias edusa, 293
Diptera, leaf-mining, in 1884, 124
Diurni of the Upper Engadine, 307; diminutive, 316
Donacia sparganii, 24

DORSETSHIRE—Anosia plexippus, 305, Aporophila nigra, 299, Gonepteryx rhamni, 21, 73, Lycæna argiades (n. Brit. sp.), 249, Vanessa antiopa, 293
Dryinus formicarius at Shiere, 220
DURHAM — Hartlepool, Chœrocampa nerii, 218

ENTOMOLOGICAL SOCIETIES. - Cambridge, 128; North Kent, 174; London, royal charter for, 237; South London, 268, 328; Haggerston, 327
'Entomologist' List, 10
Ephippiphora obscurana, 173
Epischnia farrella in Norfolk, 172
Erastria venustula, 243
Eremobia ochroleuca abundant at Gravesend, 244
Eriogaster lanestris, 121
Eriopeltis festucæ, a scale-insect new to Britain, 286
Errata, 24, 56, 79, 152, 303
ESSEX —Chœrocampa celerio, 294, Pyrameis huntera not in (correction), 24; Dovercourt, Sphinx convolvuli and Chœrocampa celerio, 261; Epping Forest during 1884, 88, notes from, 201, Lycæna corydon, 242, Pædisca oppressana, 245, Ochsenheimeria vacculella, 264; Harwich, Acherontia atropos, 258; Walthamstow, Sphinx convolvuli, 260; Walton-on-the-Naze, Chœrocampa celerio, 294
Euphrasia catena near Nottingham, 167
Eupithecia, collecting the genus, 108, 139; curzoni, 52, 76; linariata, double-brooded, 51; nanata, variation of, 75
Exchanging, 23, 48, 50, 77, 126, 127

Flies, a pest of, 220
Fossil insects, 196
Fruit *v.* sugar, 160

Gall collecting, notes on, 173
Gall-gnats, a year's work among, 36, 311
Geotrupes stercorarius, economy of, 325
GLOUCESTERSHIRE — Berkeley, Chœrocampa celerio, 165
Goniodoma, the genus, 112
Gonepteryx rhamni in Dorsetshire, 21, 73; on pink flowers, 300
Grapholitha (?) cæcana, 122; at Deal, 218; discovery of larva, 218

HAMPSHIRE—Apatura iris, 284, Deiopeia pulchella, 298; Andover, Colias edusa, 300; Bournemouth, local list of insects, 79, Chœrocampa celerio, 294, Sphinx convolvuli, 296; Christchurch, Sphinx convolvuli, 258, C. celerio, 262, celerio abundant, 296, autumn aring, 301; Lyndhurst, Colias edusa near, 241; New Forest, "Trespassers will be prosecuted," 303, 311, past season, 319, Rhopalocera, 282
Heliothis peltigera in Yorkshire, 264
Hepialus humuli, late appearance, 21; in September, 123
Hermaphodite Lepidoptera, 168
HERTS—Ware, Colias edusa, 241
HUNTINGDONSHIRE—Acherontia atropos, 258

Ichneumonidæ, introductory papers on, 13, 100, 205
Ichneumons bred, other than from Lepidoptera, 152
IRELAND — Cork, Lepidoptera, 123; South, Lepidoptera, 321

Japanese insects, relation between British and, 325

KENT—Acherontia atropos, abundance, 72, Chœrocampa celerio, 294, Lepidoptera, 70; North, Entomological Society, 174; abundance of Colias edusa and Vanessa cardui, 293, reappearance of Vanessa io, 315; Bromley, Lepidoptera in 1883, 20, 56; Chislehurst, Triphæna ianthina, 300; Cudham, Colias edusa and Eremobia ochroleuca, 257; Deal, Argyrolepia mussehliana, 218, Grapholitha cæcana, 218; Folkestone, Deiopeia pulchella, 262; Gravesend, Eremobia ochroleuca abundant, 244; Greenwich, Myelois ceratoniæ, 54; Maidstone, Sphinx convolvuli, 260; Ramsgate, Chœrocampa celerio, 261; Rotherhithe, Sphinx convolvuli, 259; Sevenoaks, Colias edusa, 241; Sidcup and Footscray, Sphinx convolvuli, 260; Tunbridge Wells, Tæniocampa leucographa, 168, Liparis monacha, 263

LANCASHIRE—Bury, Sphinx convolvuli, 295; Crosby, Chœrocampa celerio, 262; Preston, stray notes, 266; Southport, Lepidoptera, 300
LEICESTERSHIRE — Leicester, Sphinx convolvuli, 259
Leioptilus osteodactylus, 99
Light, Lepidoptera at, in 1884, 74
Lighthouses in 1884, notes on insects, 267
Limneria, 104
Liothula omnivora, life-history, 153
Liparis monacha at Tunbridge Wells, 263
List of insects, local, Bournemouth district, 79
Luperina gueneei, 54; dumerilii, 54, 73, 74
Lycæna argiades new to Britain, fig., 250, in Somerset, 292, note, 293;

artaxerxes in Rannoch, 131; bellargus, 242; corydon in Epping Forest, 242, on Barnes Common, 316; icarus, var. at Rannoch, 133, probably single-brooded in Cork, 192

Macroglossa stellatarum, late occurrence, 147; at sea, 295
Malay Peninsula, new species of Pierinæ, 146; new species of Mycalesis, 289
Melanic variation in Lepidoptera of high latitudes, probable causes, 82, 122
Melanippe tristata, 244
Melanism in Renfrewshire, 322
Meleana flammea, 241
Melitæa aurinia in Co. Cork, 123, unusual altitude, 147, in Argyllshire, shire, 229; cinxia, 217; athalia in Sussex, 265
Microgaster alvearius, 248
Microplitis ocellatæ, 327
MIDDLESEX—Ealing, Chœrocampa celerio, 293; Holloway, Sphinx convolvuli, 259; London, Chœrocampa celerio, 261, Vanessa polychloros, 315, Catocala fraxini in Hyde Park, 318
Migration of Aphides, 254, 303
Mimæseoptilus bipunctidactylus, 98; plagiodactylus, 195, life-history, 273; scabiodactylus, 150; zophodactylus, 99
Mimicry in insects, 25, 57, 248
Mounting Lepidoptera, 185
Mycalesis ustulata, new species from Malay, 289
Myelois ceratoniæ, 152; at Greenwich, 54

Naphthaline, 55, 125
Nola albulalis, scarcity, 72
Nomenclature, scientific, 46, 76, 120, and Lang's European butterflies, 45; natural history, 118
NORFOLK — Agdistes bennettii, 172; Epischnia farrella and Crambus alpinellus, 172; Cromer, Sphinx convolvuli and Chœrocampa celerio, 261
NORTHAMPTONSHIRE — Northampton, Sphinx convolvuli, 259; Peterborough, abundance of Aphides, 267
Notes from my diary, 246, 300
Notodonta trepida and trimacula in Savernake Forest, 300; bicolor and Sehirus bicolor, 300
NOTTINGHAMSHIRE — Choleva spadicea, 124; Newark, Colias edusa, 257; Nottingham, Euphrasia catena, 167; Retford, Chœrocampa celerio, 121, 293

OBITUARY — Cooke, Nicholas, 175; Cooke, Thomas, 200; Rye, Edward Caldwell, 79; Smith, Sidney, 56
Ocneria dispar at Maidenhead, 248; in Warwickshire, 263; correction, 303
Ochsenheimeria vacculella in Epping Forest, 264
Opheltes, 13
Ophionidæ, 13, 100, 205
Oriental entomology, 6, 39, 91
Oxyptilus distans, 89; pilosellæ, 98; hieracii, 98; parvidactylus, 98

Pædisca oppressana in Epping Forest, 245
Pairing of Lepidoptera of different genera, 150
Paniscus, 13
Papilio machaon at Wicken Fen, 241
Perforated ova of Lepidoptera, 324
PERTHSHIRE—Glen Tilt, Crambus myellus, 245; Rannoch, nine days at, 131
Phibalapteryx polygrammata [not] in Essex, 299
Phoxopteryx upupana near Warley, 246
Phothedes captiuncula, 266
Pierinæ, new species from Malay, 146
Pieris daplidice, 217
Platyptilia, the genus, 171; bertrami (ochrodactyla), 97, life-history, 279; gonodactyla, notes, 169, 195; isodactylus, 97
Plusia interrogationis at light, 299
Polia xanthomista in Cornwall, 287
Porthesia chrysorrhœa, urticating properties of hairs, 22
Pterophori, British, larvæ, 96; contributions to the history (with plate), 273
Pterophorus monodactylus, 99; life-history, 277
Pyrameis huntera [not] in Essex, correction, 24

Rannoch, nine days at, 131
Reference collection, 127
Reflector, for examining ventral surface of Lepidoptera, 125
Renfrewshire, melanism, 322
Resemblances, protective, in insects, 25
Retarded appearances of Lepidoptera, 323
Retinina turionana, 169
Rhopalocera in the New Forest, 282

Sagaritis, 101
Sawfly, an apterous, 247
Scoparia, the genus, 129
Scythropia cratægella, 246
Season, lateness of the past, 21; notes, 319

Sehirus bicolor and Notodonta bicolor, 300
Setting Lepidoptera unpinned, 183
Silk in Assam, the trade, cultivation, and experiments, 213
Silkworms, wild and domesticated, 213
Sirex juvencus, 302; at S. Norwood, 302; at Bognor, 302
Soaring habit of Vanessa atalanta, 51, 73
SOMERSETSHIRE—Lepidoptera, 51, 116, Lycæna argiades, 292, Sphinx convolvuli, 260; Frome, Colias edusa abundant, 257; Somerset, Acherontia atropos, 243
Sound-producing larvæ, 301
Sphinx convolvuli, 243, 258, 294; at Chichester, 258, 259: at Christchurch, 258; at Rotherhithe, 259; at Holloway, 259; at Leicester, 259; at Northampton, 259; near Maidstone, 260; near Footscray and Sidcup, 260; at Walthamstow, 260; in Somerset, 260; in Surrey, 260; at Cromer, 261; at Lewes, 261; at Dovercourt, 261; at Bury, Lanc., 295; South of England, 295; abundance at Bournemouth, 296; in Sussex, 297, 316
STAFFORDSHIRE — Captures in South, 193; Burton-on-Trent Lepidoptera, 177, 208, 231; Burton-on-Trent, Acherontia atropos, 317
Stilbia anomala, larva, 1, 53
SUFFOLK — Felixstowe, Chœrocampa celerio, 262
Sugar, fruit *versus*, 160; Acronycta alni at, 218
Sugaring at Christchurch, autumn, 301
SURREY—Sphinx convolvuli and Chœrocampa celerio, 260; Barnes Common, Lycæna corydon, 316; Esher, Donacia sparganii, 24; Holmwood, Chœrocampa celerio, 262; Norwood, Sirex juvencus, 302; Shiere, Dryinus formicarius, 220
SUSSEX—Colias edusa, 316, Melitæa athalia, 265; Bognor, Sirex juvencus, 302; Brighton, Argynnis latona (lathonia), 241; Chichester, Acherontia atropos and Colias edusa, 243, Sphinx convolvuli, 258, 259, Colias helice, 258; Eastbourne, past season, 319; Hurstpierpoint, Chœrocampa celerio, 295; Lewes, Sphinx convolvuli and Chœrocampa celerio, 261, 316; Pevensey, Chœrocampa celerio, 261

Tæniocampa leucographa near Tunbridge Wells, 168
Telenomus phalænarum, 247, 303
Thecla pruni in Berkshire, 266
Thymaris, 100
Timarcha lævigata, 267
Tortrix larvæ, abundance, 194; viridana, 245
"Trespassers will be prosecuted," 303, 318
Trigonophora flammea, life-history, 162
Triphæna ianthina at Chislehurst, 303

United States National Museum, entomological collections, 197
Urticating hairs, of some Lepidoptera, 3, 41, 43, 74; of Porthesia chrysorrhœa, 22
Urtication by larvæ of Bombyx rubi, 324

Vanessa antiopa in Dorset, 293; atalanta, 121, soaring habit, 51, 73, abundance, 51; cardui, abundance, 51, in N. Kent, 293; io, reappearappearance in N. Kent, 315; polychloros in London, 315
Vanessidæ, habits, on emergence, 241
Variation, of Eupithecia nanata, 75; melanic, probable causes, 81, in Lepidoptera of high latitudes, 122
Varieties, of Angerona prunaria, breeding, 253

WALES—North, Merionethshire, Chœrocampa celerio, 262
WARWICKSHIRE—Ocneria dispar, 263
Weather, influence on Lepidoptera, 122
WILTSHIRE—Savernake Forest, Notodonta trepida and N. trimacula, 300
WORCESTERSHIRE—Malvern, past season at, 319

Xanthia ferruginea feeding on ash, 301

YORKSHIRE—Heliothis peltigera, 264

Zygæna filipendulæ impaled, 317, var. ochsenheimeria, 317

THE ENTOMOLOGIST.

VOL. XVIII.] JANUARY, 1885. [No. 260.

NOTES ON THE LARVA OF *STILBIA ANOMALA*.

BY W. S. RIDING, B.A., M.D.

THIRTY-FOUR eggs were laid, early in September, 1883, by some worn females of *Stilbia anomala*, which had been beaten from the heather at Woollacombe, N. Devon, some days before. They were globular, pale-straw in colour (soon changing to pink), and closely striated vertically. They were laid in batches.

Though kept exposed to the open air, the larvæ emerged on October 25th, by a small hole in the side of the eggs. They did not eat the shell. The young larvæ were semi-transparent, dingy green, with a pale brownish tinge underneath, and covered with some thin hairs, both arranged longitudinally and scattered. Each had three pairs of true legs and three pairs of claspers, four very indistinct elevations in front of the claspers indicating two rudimentary anterior pairs. In moving, they looped like Geometers. When at rest, they assumed a characteristic position on the top of the blades of grass, the third part of the body being fixed, the back arched, and the head tucked in under the front segments, looking just like so many minute sea-horses. They were easily disturbed, and in falling coiled themselves in rings.

On November 4th, many were noted as having the anterior rudimentary claspers distinctly visible and the head pale brown. On the 18th, a white spiracular line was observed, and on the 25th, when some of the larvæ had grown to a size of five lines in length, and after their second moult, the colour had changed to reddish brown, and the dorsal and subdorsal as well as the spiracular lines were apparent.

On December 5th, the most developed were seven lines in length, and stretched themselves along the blades of grass when at rest, and were no longer so easily shaken off the food. The claspers on the seventh and eighth segments were by this time fully developed and the spiracles also conspicuous. From this date the larvæ gradually increased in size and the final markings became more distinct, till about the middle of January, 1884, when several appeared full-fed. Of these the following is the description:— Body, rather stout, cylindrical, smooth, tapering slightly towards each end, but mostly towards the posterior; length, 12 to 13 lines; head, semi-transparent, pale brown, spotted with a darker shade on the cheeks, and with a few scattered fine hairs. Ground colour of body pale-yellowish or reddish brown, closely spotted with darker. Dorsal line paler-edged, with dark brown shading off externally; the dark edge much intensified at the centre and division of the segments, especially at the latter, so as to give a dotted appearance, much less conspicuous on the three last segments. Sub-dorsal lines paler-edged, with continuous dark brown. Between these lines, on each segment except the two last, is a dark brown spot. The ground colour gradually deepens towards the spiracular line, above which it is rich dark brown, almost black. The spiracles have a black circumscription. The spiracular line is conspicuous, yellowish white in colour, spotted with very pale reddish brown. Below it the ground colour is much paler, so as to show a marked contrast between the upper and under surfaces. This paler band is succeeded by a similarly spotted darker one, and separated from it by an interrupted dark brown line. The second band is followed by another dark brown one, internal to the insertion of the legs. Claspers ten, the four front ones very slightly smaller than the others, but to such an extent as to be scarcely noticeable.

Up to this date the mortality had been small, only three larvæ having died. Between January 20th and February 17th the larvæ by degrees disappeared and were supposed to have pupated. The earth was not disturbed till the end of March, when it was carefully examined to remove the cocoons. It was then found that only three of the larvæ had gone down, and with the exception of four shrivelled-up bodies, there were no remains of the others to be seen, though it was impossible for them to have escaped from the cage. The larvæ must therefore be cannibals, at all events in confinement.

They had been freely supplied with plenty of fresh sods,—of species of *Poa*, mostly *P. annua*,—and kept in an ordinary-sized cage.

Imagines, not having emerged from the three cocoons at the end of last month, the latter were opened and found to contain only dried-up larvæ which had undergone no further change. The cocoons were oval, made of earth and silk, and tough.

It appears to me the true position of *Stilbia anomala* amongst its congeners will only be realized in a future classification of Lepidoptera based on the development of their larvæ.

25, Endsleigh Gardens, N. W., Nov. 7, 1884.

[It will be seen that in the 'Entomologist' List of British Lepidoptera Mr. South has removed *Stilbia anomala* from the end of the Noctuæ, and placed it among the Caradrinidæ.—Ed.]

ON THE URTICATING HAIRS OF SOME LEPIDOPTERA.

By Richard South.

Nearly twenty years ago, that is in the summer of 1865, a cousin of mine, the late Mr. William Calvert South, and myself were collecting moths in the neighbourhood of Kingsbury, where we met with several imagines of *Porthesia similis* (*Liparis auriflua*) at rest on an old fence. We each secured specimens, which we killed there and then, by a method involving the use of the thumb and index finger of the left hand. Some little time after leaving the *similis* fence I began to feel an unpleasant tingling about the eyes. This gradually increased, until at last it became almost intolerable. Further collecting was not in accord with my inclination for that day, so we set out on the homeward journey. Before I reached home my eyelids were considerably swollen, and large wheals appeared on the throat and neck. Altogether I was an object of pity and compassion, and continued so for a day or two. Curiously enough, my cousin, who had handled *P. similis* in the same way as myself, did not suffer any unpleasant effects whatever. This fact would seem to render absurd any attempt to connect *P. similis* with the symptoms developed almost immediately after handling the insects in my case. Still I have always been under the impression that "the goldtail moth" was the cause of my discomfiture on that particular summer's day in 1865. I may say that I am glad that Mr. Joseph Anderson can so satisfactorily connect cause and effect as he has done in his note respecting the urticating properties of the imago of *Porthesia similis* (*Liparis auriflua*), Entom. xvii. 275. Mr. Anderson must not suppose that I rejoice in his misfortune; I am only glad that he so directly traced the irritation he experienced to its proper source.

I have several times collected larvæ of *Porthesia* (*Liparis*) *chrysorrhœa* and bred imagines therefrom. In collecting the larvæ I had of course to handle them, but I had no occasion to touch the cocoons, and when the imagines came out they were pill-boxed and transferred to the ammonia jar, only touching them in the process of pinning. No symptoms of irritation resulted from contact with either larva or imago of this species. Had I interfered with the cocoon, irritation might have ensued, but of this I am by no means certain.

Figuratively speaking, entomologists are not as a rule "thin-skinned." But as a fact, the cuticle of most people—entomologists or not—is more or less sensitive to irritants of any kind. I knew a man whose skin was so extremely sensitive that the immediate contact of a woollen under-garment therewith gave rise to symptoms analogous to "nettle-rash," if it did not indeed cause true urticaria. One individual may be far more susceptible than another to the urticating properties of certain Lepidoptera. Probably even the same individual may at some periods of his life be more prone than at others to suffer from contact with the larva, cocoon, or imago of urticating Lepidoptera. I should think that when one has been hard at work collecting, and the "pores of the skin" are freely opened, one would be very liable to experience the full irritating power of certain larval hairs, &c.

Since 1865 I have only once experienced anything like the torments inflicted on me by the *P. similis* imagines. The instance I refer to happened on my first introduction to the larva *Bombyx rubi* in 1874. I had been picking up a large number of those larvæ, and the exertion caused perspiration. After passing my hand across my perspiring brow, I had a repetition of the *similis* attack, but in a much milder form. Since then I have, nearly every season, taken up odd larvæ of *Bombyx quercus*, *B. rubi*, and *Odonestis potatoria*, and in every case have noticed that the tips of my fingers and thumb were thickly "felted" with the hairs of the larva handled. Since my *B. rubi* experience I have always been studiously careful not to touch my face or neck. At the same time, when my hands have been hot I have frequently found a slight itching between the fingers, but the hairs sticking into the thicker skin of the thumb and fingers, did not cause any itching in those parts.

Mr. Swinton, in 'Notes on the Urticating Property of the Hairs of the Larvæ of *Liparis auriflua* (*Porthesia similis*),' communicated to the Entomological Society of London, August 6th, 1879, expresses his opinion that the hairs of the larva are covered with a poisonous liquid, exuded from the scarlet warts on the hinder segments. This is the only suggestion I can find as to the probable cause of the intense irritation set up by the hairs of the larva of this species. Assuming Mr. Swinton to be right with regard to the hairs of the larva, what about the hairs of the imago? Are these also coated with a poisonous liquid?

The hairs of larvæ of the genus *Cnethocampa* are barbed (one species of the genus, *pityocampa*, was reported as occurring in Kent, in 1873-4), and possess great urticating power. The hairs of the larva are perhaps the most virulent, but the hairs of the imago, and even the dust of the web, are capable of causing great irritation. It may be supposed that the greater irritation of the larval hairs as compared with those of the imago or the dust from the nest, is due to their barbed points. Especially would this appear to be the case if, as I have been informed, irritation in its severest form is apt to return at intervals for years after contact with the hairs of the larva.

Whether irritant poisons are or are not introduced with the hairs, may afford matter for discussion; but it does not appear altogether unreasonable to suppose that the hairs in themselves—especially barbed hairs — are quite capable of producing a considerable amount of discomfort, if not absolute pain, when introduced liberally into the human skin.

That pain is, sometimes at least, due to other than mere mechanical action of the hairs, is suggested by the following incident I remember to have read in an entomological work, the title of which does not occur to me at the present moment. A traveller in some part of South America picked up a large hairy caterpillar. In handling it he sustained something akin to an electric shock. This was given with such power as to render his arm useless for a time!

Other "big things" in the way of caterpillars with unpleasant urticating properties are found in Brazil. The greatest efforts of our stinging species are but puny, when compared with the very disagreeable way these Brazilian larvæ have of resenting any interference with their liberty, as the following extract from 'Pioneering in Brazil,' by Mr. T. P. Bigg-Wither, will show. Writing of a tribe of *phosphorescent* hairy caterpillars, the author says:—"The varieties of these caterpillars were legion. Their bodies were protected by triple coats of mail, that is to say they were covered with a hairy substance, which in some species took the form of moss, and in others of groups of stag antlers. To attempt to touch these creatures with the naked hand was a scarcely less hazardous undertaking than plunging one's hand into a live hornet's nest. Each hair, or point, has the power of inflicting a sting as painful as that of a certain venomous species of red ant very common in parts of the forest, so that, if by chance, as not unfrequently befel us when working on the *picada*, one of these caterpillars happens to drop off a tree on to the hand, or, worse still, on to the nape of the neck, the pain is almost unbearable, the spot on which the creature falls immediately becoming inflamed, and afterwards swelling up to a great size."

12, Abbey Gardens, London, N.W., December 9th, 1884.

ORIENTAL ENTOMOLOGY.

By the Rev. F. A. Walker, D.D.

The accompanying observations are founded principally on the Appendices to my work, 'L'Orient,' March 1—June 30, 1882, as well as those to 'Nine Hundred Miles up the Nile,' November 3, 1883—February 9, 1884.

Of all butterflies that I noticed during my two expeditions to the East, no species that may fairly claim to be termed Oriental proved so abundant as *Thais apollina* and *Danais chrysippus*, the former occurring in Palestine and Syria, during the months of March and April, 1882, and the latter in Egypt, during November and December, 1883; or I might state with correctness that these two kinds were the commonest of all, *Vanessa cardui* alone excepted. Both *Thais apollina* and *Danais chrysippus* are easy of capture, the former affecting the Plain of Sharon and slopes of the Mount of Olives, as well as the meadows in the vicinity of Baalbec and Shtora, and the latter frequenting the gardens at Heliopolis, the Island of Roda, and the grounds of the palaces and villas in the neighbourhood of Cairo. It is probably owing to the scarcity, comparatively speaking, of wild flowers in Egypt, that the *Danais* was generally found fluttering round the scarlet poinsettias, or settled on the gay blossoms of a large bed of zinnias, but rarely outside the region of cultivation, whereas the *Thais*, which I never saw till after reaching Palestine, disported itself on and among the variously-coloured vetches, the scarlet anemone, no less brilliantly tinted tulips (*Ranunculus asiaticus* and *Tulipa oculisolis*), Star of Bethlehem, and sundry other blossoms of the flowery plain or hill-side. Both *Thais* and *Danais* were, generally speaking, in good condition. Early spring is evidently the season for the former, late autumn and the beginning of winter the time for the latter species; but by the middle of January, on my return to Cairo, after three weeks' absence up the hills, colder weather had set in, and all butterfly-life, for the time at least, disappeared. A perfectly fresh specimen of *T. apollina* has a dark gauze-like appearance over the whole of the upper wings, and a primrose tint (with the exception of the red and dark blue of the ocelli that form the border) over the lower. In the case of a more worn individual the gauze-like appearance is the first to go, in one still more faded the primrose tint also, until the upper wings are nearly transparent, except for the three black spots which mark its affinity with the Apollinidæ. Whether or no the sexes are distinguished by the respective faintness or vividness of the markings is more than I have knowledge in this instance to say.

I was also fortunate enough to see six or seven specimens of *Thais cerisyi* in Syria and to capture three, two at Shtora and one at Baalbec. I attributed its scarcity to the fact that I was too early in the field for this particular kind, but have had reason to correct this view, owing to Mr. Butler's informing me that I was too late, and that, on the contrary, it is on the wing before *T. apollina*.

Among Pieridæ *Aporia cratægi* was decidedly the most common. So torpid was this insect on our arrival at Ephesus, on May 5th, that it could be taken with ease by the fingers in the course of the afternoon, off the abundant blossoms and flowering shrubs on the lower slopes of Mount Prion, as we ascended to the stadium and tomb of St. John, or else was only roused to settle again. *P. daplidice* has a tolerably wide distribution, occurring on the banks of the Jordan, and half-way between Jerusalem and Jericho, and in the bed of the then dried-up stream of the Sara-kisi above Philadelphia, and by its capture at Colonos and Cerameicus recalling classic memories alike of blind Œdipus and Antigone, as well as of the first year of the Peloponnesian war. *P. brassicæ* and *P. rapæ* occurred, but only sparingly. There were several specimens, but all female, of *Euchloë cardamines*, on or about the rock of the Acropolis. Of two foreign species, *A. belemia* and *A. belia*, I captured three of the former, namely, one at Beyrout and two between Jaffa and Latroon, and one of the latter in the bed of the Sari-kisi above mentioned. On the upper side both *A. belemia* and *A. belia* closely resemble *A. cardamines* female, but are both smaller insects, *belemia* decidedly so, and this butterfly has the green spots or blotches of *cardamines* replaced by stripes. *A. belia* and *A. cardamines* are more nearly alike, but the white between the green spots of *A. cardamines* is silver on the under side of *A. belia*.

Colias edusa, as a matter of course, was generally distributed, and *Gonopteryx rhamni* and *G. cleopatra* were both noticed. Neither species were plentiful; the former occurring at Shtora on April 18th; of the latter I captured a female at Alexandretta, on April 28th, and saw the males for the first time in June, among the highly-scented scrub vegetation of cistus, arbutus, myrtle, and heather, and subsequently in Corfu.

Three of the four European species of *Papilio* were captured, *P. machaon* at Smyrna and Ephesus, *P. podalirius* at Baalbec, and *P. alexanor* at Ephesus. Of this last-named kind this was the only specimen that I have ever seen alive, and a large one and in fine condition.

To come next to the Satyridæ, *Minois actæa* and *anthelea*, and *Satyrus semele* were common in Deceleia road to Laurinum and other places in the neighbourhood of Athens, as also *Arge titea* and *A. galathea* on the Acropolis and road to Eleusis. *A. titea* was rather the more abundant of the two, but the difference between these two species is not discernible on the wing. I also took one specimen of *Satyrus ida* in Corfu, and a *Yphthima*, species undetermined, at Alexandretta, of which last I regret I had only one indifferent specimen, as I have been unable to find it in the national collection, but can certify to its also occurring above the Nahr-el-Kelb.

Of Fritillaries I only captured five species: *Melitæa trivia* at Ephesus, *Argynnis lathonia* and *Melitæa athalia* at Philadelphia, *M. cinxia* at Belgrade, and *M. didyma* in Corfu.

The remaining butterflies may be briefly enumerated: *V. camilla* in Prinkipo, *Lycæna melanops* at Alexandretta, *C. phlæas* and *P. alexis* at Ephesus, and *Pamphila linea* and *alceæ* at the Acropolis, Athens; and, on my second visit to the East, two species of *Deudorix*, *Lycæna bœtica*, *Tarucus nana*, and *Zizera*, possibly *Kassandra*, at the end of November and beginning of December, as well as *Pamphila nostradamus* in and about Cairo. *Lycæna bœtica* and *Vanessa cardui* were also seen at Aboo Simbel. *Vanessas* were neither abundant in number, with the exception of *V. cardui*, nor in kind. The only rare insect that I came across of this tribe was a solitary specimen of *Grapta egea*, which I unfortunately missed, in the bed of the Sari-Kisi.

Of moths the number of species is very scanty, so far as my personal observation went,—to wit, *Saturnia pyri* at Beyrout, *Arctia villica* on the banks of the Meles, *Zygæna brizæ* in the Stadium and Pagæ, at Athens, and *Z. carniolica* in the Pass of Daphne, *Dasydia obfuscata* (Scotch annulet) at Alexandretta, *Venilia maculata* (speckled yellow) at the entrance to the Wady Ali, and, on my second journey, *Chærocampa celerio* at the New Hotel, Cairo, in December.

(To be continued.)

REMARKS UPON THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

In Mr. Dunning's review in the 'Entomologist' (vol. xvii. p. 213) of this list, and his enumeration of the species mentioned in it, there is a clerical error which requires correction. Mr. Dunning states the number of Tortrices recorded in it to be 245, whereas the number really is 343, and this correction will bring up the total number of species in the list to 2080 instead of 1982, the whole number mentioned according to Mr. Dunning.

In any new edition of the list Mr. South will doubtless pay attention to the valuable suggestions contained in Mr. Dunning's critical review of it, but I would add for Mr. South's consideration one or two further remarks on the contents of his list. The genus *Aporophyla* of Guenée appears in two places, first among the *Apameidæ* (p. 6), and again smong the *Hadenidæ* (p. 9). The genus *Calamia*, too, of Hübner, appears on page 5, and again on page 6.

In compiling his list in conformity with the law of priority, Mr. South appears to have overlooked the desirability of avoiding the same name for different insects. In Doubleday's list the same specific name was occasionally used to denote more than one insect, but these instances are few in number, viz., *comma*, *cratægi*, *ligustri*, *populi*, *quercus*, *rubi*, *urticæ*, and the insects denoted in Doubleday's list by the same specific name belong to different groups. Mr. South, however, appears to have considerably increased the inconvenience thus occasioned, for in over 70 cases the same specific name is applied in his list to different insects—often, moreover, to different insects in the same group, and in many instances with the same author's name following. The confusion that must necessarily ensue in the minds of young and indeed old entomologists, will be gathered from the following instances which are taken from the list, especially when it is borne in mind that entomologists are careless as to postfixing the name of the author to the specific name. For facility of reference I have numbered consecutively the species enumerated in Mr. South's list and indicate them accordingly :—

32	Æthiops, *Esp.*	1588	Æthiops, *Westw.*
413	Affinis, *L.*	1580	Affinis, *Dougl.*
1012	Ahenella, *Zinck.*	1801	Ahenella, *Wk.*
1405	Albipunctella, *Haw.*	1532	Albipunctella, *Hb.*
1190	Angustana, *Hb.*	1319	Angustana, *Hb.*
1835	Apicella, *Sta.*	2039	Apicella, *Sta.*
1892	Arcuatella, *Sta.*	2060	Arcuatella, *H. S.*
506	Argentula, *Hb.*	1836	Argentula, *Zell.*
1586	Artemisiella, *Tr.*	2011	Artemisiella, *H. S.*
1777	Auroguttella, *St.*	1793	Auroguttella, *Fisch.*
556	Autumnaria, *Wernb.*	679	Autumnaria, *Gn.*
1365	Avellanella, *Hb.*, *Sta.*	1784	Avellanella, *Sta.*
41	Betulæ, *L.*	995	Betulæ, *Göze* 1787 Betulæ, *Sta.*
1112	Bifasciana, *Haw.*	1843	Bifasciana, *Hb.*
3	Brassicæ, *L.*	294	Brassicæ, *L.*
1336	Ciliella, *Hb.*	1526	Ciliella, *Sta.*
64	Comma, *L.*	247	Comma, *L.*
1078	Corticana, *Hb.*	1199	Corticana, *Hb.*
221	Coryli, *L.*	1959	Coryli, *Nic.*
1488	Costella, *Fb.*, *Sta.*	1589	Costella, *Westw.*, *Sta.*
838	Cratægella, *Hb.*	1468	Cratægella, *L.*, *St.*
2	Cratægi, *L.*	164	Cratægi, *L.*
130	Cribrum, *L.*	974	Cribrum, *Schiff.*
412	Diffinis, *L.*	1562	Diffinis, *Haw.*, *Sta.*
46	Dispar, *Haw.*	158	Dispar, *L.*
1236	Distinctana, *Bent.*	1284	Distinctana, *Hein.*
1459	Fasciellus, *Fb.*	1667	Fasciellus, *Hb.*
252	Flammea, *Curt.*	441	Flammea, *Esp.*
1092	Fuligana, *Hb.*	1114	Fuligana, *Haw.*
996	Fusca, *Haw.*	1762	Fusca, *Sta.*,

And so on in seventy-six instances.

Hildebrand Ramsden.

26, Upper Bedford Place, Russell Square, W.C.,
December 8, 1884.

[We have referred the above communication to Mr. South, and append the following from that gentleman.—Ed.].

Mr. Hildebrand Ramsden's remarks on my list offer me an opportunity of saying a few words. Firstly, in extenuation and explanation of an oversight in the matter of the two genera *Aporophyla* and *Calamia*. Secondly, in reference to Mr. Ramsden's observations on duplicate trivial names. Several gentlemen had already (Mr. Jos. W. Harris as early as August 18th, 1884) called my attention to the fact that the genus *Calamia* and the genus *Aporophyla* each occurred twice in my list. In my MS. list I had pencilled in *Calamia* above *lutosa*, and *Aporophyla* above *lutulenta* and *nigra*, thus indicating the genera in which these species occurred in 'Staudinger's List.' On sending the MS. to the printers I omitted to erase the generic names written in pencil, and in revising the proof-sheets the repetition escaped my notice. I need hardly say that I regret having thus laid myself open to the charge of carelessness. Such an imputation one reviewer has in fact brought against me, and in evidence thereof refers to these unfortunate repetitions.

Apart from the inevitable strictures on my shortcomings, I did not suppose that my list would be accepted without comment. At the same time I may say that I was not prepared for such objections as Mr. Ramsden has brought forward in regard to specific names. Mr. Ramsden says that I appear to have "overlooked the desirability of avoiding the same name for different insects." With all due deference to Mr. Ramsden's opinion in this matter, I must confess that I fail to recognise the desirability of altering specific names so as to facilitate the use of such names only. To argue that a *Nepticula*, for example, should not bear the specific name of *arcuatella*, because a species of the genus *Scardia* already bore that name, is as illogical as to say that Smith's son should not be called John, because the son of Jones was already named John, and in after life confusion might ensue as to their identity, because they were both named John.

It does not appear to occur to Mr. Ramsden, that when two or three species bear the same trivial name, the generic name taken in conjunction therewith is of some importance in denoting the species we wish to refer to. He would seem to attach greater value to the author's name following the specific name. To speak or write of *comma*, L., would not convey any distinct idea of the species intended, but if we say or write *Hesperia comma*, L., or *Leucania comma*, L., we refer definitely to a species of Lepidoptera. It is a common practice of some lepidopterists to speak of the objects of their study by their trivial names only, and the generic name is never used by them if they can possibly avoid it, but "it is a custom more honoured in the breach than the observance."

I do not quite understand Mr. Ramsden where he says, "in over 70 cases the same specific name is applied to different insects." But in looking over the interesting list of duplicate and triplicate specific names he has been at the trouble of drawing up, I find that in 71 instances two insects bear the same specific name, and in 5 cases three insects have each the same specific name. As an example of the frequent use of the same specific name in different genera, in other branches of Natural History, I may mention an instance in the latest standard work on British Fishes (Dr. Day's 'Fishes of Great Britain and Ireland') in which the trivial name *vulgaris* is indexed to no less than fifty-two genera, and this is by no means an isolated case.

RICHARD SOUTH.

12, Abbey Gardens, London, N.W.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*),

OPHELTES, *Holmgr.*

Fulvous; part of head and thorax and apex of abdomen black.
1. *glaucopterus*, 7—9 lines.

This fine species, of which the male is almost unknown (Entom. xii. 55), is not common in Britain. It is figured by Panzer (Schæf. Ic., pl. 82, fig. 3). It is a sawfly parasite, having been bred from the three species of *Cimbex*, thus being a conspicuous exception to the general lepidopterous parasitism of the Ophionidæ. Hartig, Drewsen, Reissig, Giraud and Brischke bred it from *Cimbex femorata* (*variabilis*), Giraud from *C. humeralis* (*axillaris*), and Siebold from *C. connata;* the latter from eggs deposited by a virgin mother (Ent. Nach., x. 95).

PANISCUS, *Schr.*

Almost entirely fulvous.
A. 1st segment of the abdomen hardly shorter than the hind coxæ and trochanters; aculeus of female about as long as the 1st segment (males and females).
a. Tarsi pale yellowish white, lighter than tibiæ. *tarsatus*, 4½—5½ lines.
b. Tarsi and tibiæ of the same colour.
* Sides of head behind the eyes, seen from above, parallel.
† Larger; elevated line before apex of metathorax.
1. *cephalotes*, 6—9½ lines.
†† Smaller; no elevated line before apex of metathorax.
fuscicornis, 3—5 lines.
** Sides of head behind the eyes slanting. - 3. *testaceus*, 4½—9 lines.
B. 1st segment of abdomen shorter than the hind coxæ and trochanters; aculeus of female hardly exserted; hind tarsi paler than tibiæ (male and female). - - - 2. *virgatus*, 3—5 lines.

The species of *Paniscus* are amongst the commonest of our Ichneumons, but they are rather difficult to distinguish; they bear considerable resemblance to the species of *Ophion* in many respects, but the neuration will at once distinguish them. *P. tarsatus*, Brischke (Trans. Ent. Soc. Lond., 1881, p. 157), and *P. fuscicornis*, Holmgr. (Entom. xvii. 67), are added to the species included in Marshall's catalogue. Neither species are uncommon in Britain, the former appears to be especially attached to the species of *Eupithecia;* its elongate, cylindrical, smooth, hard, black cocoon, with a narrow median pale band, is figured on plate ii., fig. 7. *P. inquinatus*, Gr., is omitted, as no author has referred to this species since Gravenhorst described the two females captured near Netley, by Hope; and he opines that their colour was not natural. It may either be a good species, or probably the same as Holmgren's *P. cephalotes*. Ratzeburg has figured the wing of *P. testaceus* at Die Ichn., vol. ii., pl. i., fig. 25, and see Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 20. Boie mentions parthenogenesis in *P. testaceus*, in Wiegmann's Archiv., ii. 38. The life-history of *Paniscus* has already been fully referred to (Entom., xvii. 124; and see Ent. Nach., v. 221, 265); so we will here merely give the list of hosts:—

1. cephalotes, *Holmgr.*, from Orgyia pudibunda, Pœcilocampa populi; Brischke. Dicranura vinula; generally. D. bifida; Baker. Acronycta tridens, A. psi, A. megacephala, Cucullia scrophulariæ, C. thapsiphaga*, C. asteris, C. balsamitæ*, C. artemisiæ*, C. argentea*; Brischke.
2. virgatus, *Fourc.*, from Odontopera bidentata; Bignell. Eupithecia absynthiata, E. sp.? Brischke. E. succenturiata; Bignell. Drepana unguicula; Brischke. Dicranura bifida; (Richter) Grav. Cosmia trapezina; Bignell. Hadena pisi; Newport. Catocala promissa; Giraud, Brischke, Bignell. Halias prasinana; Brischke, Bignell.
3. testaceus, *Gr.*, from Smerinthus populi; Marshall. Bombyx pini*; (Reissig) Ratzeburg. Phigalia pilosaria, Nyssia pomonaria*; Scharfenberg. Eupithecia castigata; Bignell. Dicranura vinula; generally, but often undistinguished from P. cephalotes, see Albin's plate xi. D. bifida; Brischke. D. furcula; Ratz. Hybocampa Milhauseri*; Taschenberg. Clostera anachoreta; Vollenhoven. Acronycta leporina; Brischke. A. psi; Raynor, Warren. A. megacephala; (Perris) Gir. Nonagria geminipuncta; Flet-

cher. Mesogona oxalina*; (Rogenhofer) Gir. Hadena pisi; Marsh. H. dentina, Xylina rhizolitha; Bignell. Cucullia scrophulariæ; Siebold. C. lychnitis; (Goossens) Gir. C. asteris; Speyer. C. argentea*; Brischke.? C. artemisiæ*; Grav. Toxocampa craccæ; Kriechbaumer. Cimbex femorata, Clavellaria amerinæ; Bouché.

fuscicornis, *Holmgr.*, from Lithostege nivearia; Raynor. Leucania obsoleta, Anarta myrtilli; Brischke.

tarsatus, *Brischke*, from Eupithecia succenturiata; Brischke. E. castigata; Brischke, Bignell. E. virgaureata; Bignell. E. vulgata; Fletcher. E. absynthiata; Brischke, Bignell. E. lariciata; Brischke, Bignell. E. abbreviata; Bignell. E. exiguata; Brischke, Warren. Drepana falcula, D. unguicula Brischke.

ABSYRTUS, *Holmgr.*

Fulvo-testaceous; eyes and spot between the ocelli blackish (male and female). - - - - - - 1. *luteus*, 3—3½ lines.

Holmgren described this genus and species in his 'Monographia Ophionidum Sueciæ' (p. 33); it does not appear to be rare. He there points out that it is mixed with *Mesoleptus testaceus* in collections. It is also much like *Paniscus virgatus;* but may be distinguished from the former by its pectinated claws; and from the latter by its subrotund metathoracic spiracles, and by the inferior tooth of the mandible being longer than the superior; the neuration of the wings also differs. The *Absyrtus* does not appear to have been bred.

CAMPOPLEX, *Grav.*

A. Back part of metathorax concave (males and females).
a. Abdomen entirely black.
* Scape of antennæ pale beneath. - - 10. *myrtillus*, 5 lines.
** Scape of antennæ not pale beneath.
† Legs yellow: coxæ, trochanters, hind femora, apex of middle femora, and base and apex of hind tibiæ black. - *nobilitatus*, 6 lines.
†† Legs red; coxæ, trochanters, apex of hind tibiæ and tarsi dark. 7. *ebeninus*, 2½—4½ lines.
b. Abdomen more or less red or yellow.
* Middle of abdomen and part of legs yellow.
† Spaces between the punctures of the mesopleura reticulate. 1 (part). *falcator*, 7½—10½ lines.
†† Spaces between the punctures of mesopleura smooth and shining. 1 (part). *oxyacanthæ*, 4—8½ lines.

** Abdomen and legs partly red or reddish yellow.

‡ Hind femora entirely red.

§ Mesopleura in front with a vertical ridge.

× Lower margin of 3rd segment of abdomen concave.

2nd and 3rd segments of abdomen with a brownish mark on the side. 5. *cultrator*, 8 lines.

×× Lower margin of 3rd segment not concave.

Middle of abdomen red. - - - - - *obreptans*, 4 lines.

§§ Mesopleura in front without a vertical ridge.

Middle of abdomen red; 3rd segment without a lateral black streak. *juvenilis*, 3½—4½ lines.

‡‡ Hind femora black, or partly black.

o Hind tibiæ black; 3rd segment below not concave.

+ Abdomen red; base and more or less of apex black; between the punctures of the mesopleura reticulate; no vertical ridge behind front coxæ. - - - - - *erythrogaster*, 4½ lines.

++ Middle of abdomen red; between the punctures of the mesopleura smooth, with a ridge behind front coxæ (male). *punctatus*, 5 lines.

oo Hind tibiæ not entirely black, more or less red or reddish yellow.

++ Mesopleura between the punctures smooth.

∽ Mesonotum between the punctures smooth. *bucculentus*, 5—6 lines.

∽∽ Mesonotum between the punctures reticulate.

’ 3rd segment of abdomen more or less concave below.

! Abdomen in the middle widely, and legs yellowish or testaceous: coxæ, hind trochanters and base of femora black; mesopleura without a vertical line behind front coxæ. 3. *carinifrons*, 8—10 lines.

!! Middle of abdomen and part of legs red; mesopleura with a vertical line behind front coxæ. - - - 6. *nitidulator*, 6½ lines.

” 3rd segment of abdomen not concave below (female). *rugulosus*, 8 lines.

++++ Mesopleura between the punctures reticulate; transverse anal nervure divided below the middle.

* 3rd segment of abdomen more or less concave below; forehead most frequently with an elevated ridge.

† Mandibles and tegulæ black; aculeus of female long.

Middle of abdomen, greater part of front legs and middle of hind tibiæ red. - - - - - *terebrator*, 5—6 lines.

†† Mandibles pale; aculeus not long.

3rd, 4th, and sometimes 5th segments of abdomen red.

‡ Transverse anal nervure of hind wings divided just below the middle; scutellum at sides marginated almost to the middle.

§ 3rd, 4th, and 5th abdominal segments and part of legs red. 2. *pugillator*, 5½ lines.

§§ 4th and 5th segments black. - - - *unicinctus*, 7 lines.

‡‡ Transverse anal nervure divided almost at the bottom.

Post petiole with three longitudinal oblong depressions; middle of abdomen and part of legs red. - - *trisculptus*, 7 lines.

** 3rd segment of abdomen not concave below.

Mesopleura with a distinct vertical ridge behind the front coxæ.

o Fovea of antennæ dilated above into a distinct ear-like process.

Middle of abdomen red; greater part of legs red. *anceps*, 5—5½ lines.

oo Fovea of antennæ not dilated above.

1. Forehead above the antennæ furnished with several prominent vertical ridges.

Middle of abdomen red; legs yellow, hind coxæ, trochanters, base and apex black; tarsi slightly brownish (male). *costulatus*, 5½ lines.

2. Forehead without ridges above the base of the antennæ.

' Apex of hind femora red.

Apex of 2nd segment, 3rd entirely, and extreme base of 4th chestnut (female); legs and abdomen of male paler, red colour more extensive. - - - - *femorator*, 7—7½ lines.

" Apex of hind femora not red.

! Middle of abdomen and greater part of front legs yellowish; middle of hind tibiæ broadly yellow; 3rd segment without a lateral black streak. - - - - - - *confusus*, 6½ lines.

!! Middle of abdomen red; legs partly red; 3rd segment with a lateral black streak; sides of metathorax moderately pubescent; groove of metanotum regularly transversely rugose. *tenuis*, 4½—5 lines.

B. Back of metathorax not concave (male and female).

Middle of abdomen and legs partly red. 8. *leptogaster*, 4—5 lines.

Gravenhorst's original genus *Campoplex* has been broken up by Holmgren, in his 'Monographia Ophionidum Sueciæ,' into many subgenera, which may be arranged in two divisions—those having the metathoracic spiracles elongate, with one exception (*Charops decipiens*), forming the genus *Campoplex;* and those in which they are circular, subdivided into eight subgenera. Later, Förster divided his family *Campoplegoidæ* into sixty-two genera, in his 'Synopsis der Familien und Gattungen der Ichneumonen'; these have not been adopted. Förster's 'Monographie der Gattung Campoplex, Grv.' (Verh. z.-b. Ges. Wien, xviii. 761—876, pl. x.; 1869), and Holmgren's 'Om de Skandinaviska arterna af ophionidslägtet Campoplex.' (Bihang Sv. Ak. Handl., vol. i., pt. 2, pp. 1–90), must be consulted for this genus; seventy-nine species are described in the former and forty-two in the latter paper. There is a very great similarity in the coloration of the species; Förster divided them into two groups according to the colour of the hind femora (red or black). Other distinctions are that the spaces between the punctures of the mesopleura are smooth or reticulate; at the front part of the mesopleura, just above the anterior coxæ, is an oblong depression into which the base of the front legs fits; this groove is sometimes smooth behind, or it is as it were separated from the mesopleura by a vertical ridge; the lower margin of the third segment of the abdomen is either convex or concave; the absence or presence of a lateral streak at the base of the third segment; the colour of the mandibles and tegulæ, &c. From these remarks it may be gathered that specimens of *Campoplex* gummed down on a card are almost valueless. The best way is to set them lengthwise on a narrow strip of card not more than one-sixteenth of an inch wide, so that it does not project beyond the front coxæ, and pin the card; if the insect is pinned in the ordinary way, the slender compressed abdomen has a remarkable tendency to break off. Marshall's Catalogue enumerates twelve species. Of these *C. mixtus*, Gr., has been cut up. It is impossible to say what has not been included under *C. pugillator*. Of Desvignes' species the only true *Campoplex* is his *C. myrtillus;* his *C. henaultii* is certainly *Casinaria vidua*, Gr. and his *C. placidus* much resembles *Limneria vulgaris*, Tschek, or it may possibly be a *Casinaria;* it is not a *Campoplex*. *C. anceps*, Holmgr. (Ent. Ann. 1874, p. 143), *C. obreptans*, Först., *C. confusus*, Först., *C. erythrogaster*, Först., *C. terebrator*, Först. (Trans. Ent. Soc. Lond., 1882, p. 149), *C. bucculentus*, Holmgr., (Trans. Ent. Soc. Lond., 1884, p. 426), *C. nobilitatus*, Holmgr., *C. unicinctus*, Holmgr. (non Grav.), *C. trisculptus*, Holmgr., and *C. tenuis*, Först., are now known as British. *C. punctatus*, Bridgm., *C. costulatus*, Bridgm., and *C. femorator*, Bridgm., are new species. Holmgren says of *C. melanarius:*—"Haec species structura metathoracis et abdominis ad propriam subdivisionem forte rectius referenda" (Mon. Oph. Suec., p. 37); later he considered it a *Limneria*. Tschek includes it in *Sagaritis*.

For outline figure of *Campoplex* see Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 19. The species of this genus appear to be exclusively parasitic on Lepidoptera (records to the contrary belonging to other genera), and their economy is somewhat peculiar, as the cocoon of the parasite is frequently spun under and concealed by the larva-skin of its host. Boie says his "*C. cajæ* emerged from the head of the young larva of *A. caja* at the end of June," but this may be a *Limneria*. Ratzeburg first noticed this. He says:—"The larva (of *Orgyia antiqua*) remained in good condition, but the parasitic larva (of *Campoplex carbonarius*) had gnawn through its belly and pupated in a white cocoon, which closely adhered to the leaf; and it emerged as an imago, through a hole in the back of the larva of about the size of a millet seed" (Die Ichn., i. 93). A similar case is figured on pl. ii., fig. 23, which represents the cocoon of *C. ebeninus* under the larva-skin of its host (*Orgyia fascelina*). Pl. ii., fig. 6, represents the hard, smooth, cylindrical, black-veined, brown cocoon of *C. oxyacanthæ* ex *Himera pennaria;* and fig. 24 represents the cylindrical, woolly, drab cocoon of the same species ex *Fidonia piniaria.*

The following species have been recorded as bred; but, as has been said, their determination is sometimes uncertain:—

1. mixtus, *Gr.*, from Orgyia pudibunda; Brischke. Biston hirtaria, Amphydasis prodromaria; Bignell. Pygæra bucephala; Brischke, Marshall, Bignell, Norgate. Notodonta camelina; Osborne. N. ziczac; De Geer. Acronycta sp., Cucullia argentea*, C. sp.; Brischke. Anarta myrtilli; Desvignes' Coll. Halias prasinana; Brischke.

falcator, *Thunb.*, from Pygæra bucephala; Norgate. Notodonta ziczac; Bignell.

oxyacanthæ, *Boie*, from Himera pennaria; Bignell, Brischke (*mesoxanthus*, Först.). Fidonia piniaria; Fitch. Miselia oxyacanthæ; Boie.

2. pugillator, *Gr.*, from ?Aporia cratægi; (Reissig) Ratzeburg. Thecla betulæ; Eedle. ?Zygæna filipendulæ; De Geer. Z. rhadamanthus*; (Fallou) Giraud. Odontopera bidentata; Brischke. Amphydasis betularia; Bignell. Gnophos obscurata; Drewsen and Boie. Corycia temerata, Bignell. Selidosema tæniolaria*; Gir. Cheimatobia brumata; Drewsen and Boie, Rothlieb. Eupithecia abbreviata; Bignell. E. absynthiata; Bignell, Wilson. Anticlea rubidata; Brischke. Notodonta dictæoides; Brischke. N. ziczac; Linné (query an Anomalon). Gonophora derasa; Rothlieb. Cymatophora ridens, Tæniocampa populeti; Bignell. Hecatera dysodea, Cucullia sp.; Brischke. Heliothis marginata; Boie. H. dipsacea; Gir. Halias quercana; Boie, (Perris) Gir. Phibalocera quercana; (Richter) Grav.

3. carinifrons, *Holmgr.*, from Macaria æstimaria*; (Perris) Gir. Also bred by Bignell.

4. validicornis, *Holmgr.*, from Eupithecia succenturiata, Cucullia artemisiæ*; Brischke.

6. nitidulator, *Holmgr.*, from Eupithecia venosata; D'Orville.

7. ebeninus, *Gr.*, from Orgyia fascelina; Holmgren, Harwood, Bignell. Hyponomeuta evonymella; (Siebold) Ratz.

carbonarius, *Ratz.*, from Orgyia antiqua; Brischke, Ratz. O. gonostigma; Brischke. O. fascelina; Bouché, Nördlinger, (Graff) Ratz. Tæniocampa populeti; Mrs. Hutchinson. Tortrix xylosteana; (Graff) Ratz.

8. leptogaster, *Holmgr.*, from Cabera pusaria; Brischke (not, teste Kriechbaumer), ? Boie (n. s. near *mixtus*, Gr.).

10. myrtillus, *Desv.*, from Anarta myrtilli; Desvignes.
anceps, *Holmgr.*, from Eupithecia actæata*; Brischke.
bucculentus, *Holmgr.*, from Odontopera bidentata, Lomaspilis marginata, Heliothis marginata; Brischke.
confusus, *Först.*, from Tæniocampa populeti; Bignell.
rugulosus, *Först.*, from Trachea piniperda; Norgate.
erythrogaster, *Först.*, from Hybernia rupicapraria; Bignell.
eurynotus, *Först.*, from Thecla betulæ; Eedle.
n.? sp., from Tortrix forsterana; Elisha.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEPIDOPTERA NEAR BROMLEY, 1883.—Mr. Watchurst's notes (Entom. vol. vii. p. 278) remind me of my own captures at light, at Lower Camden, between Chislehurst and Bromley, in 1883. I have already given a short list of some of the species taken up to August 15th (Entom. xvi. 233); an account of those taken after that date will perhaps prove interesting:—August 16th, a moonlight night, only *Plusia gamma* appeared. August 17th–27th, *Anaitis plagiata*, *Lophopteryx camelina*, &c. August 28th, the following appeared for the first time: *Noctua plecta*, *Triphæna comes* (*orbona*), *Luperina testacea*, *Noctua rubi*, *Cidaria silaceata*, *Melanthia ocellata*. With regard to the last, Newman merely states that it appears in June; is it usual to have a second brood? August 29th, *Eugonia alniaria* (*tiliaria*) and *Cidaria testata* appeared for the first time. August 30th, *Rumia luteolata* (*cratægata*), first appearance; took another *M. ocellata*. August 31st, first appearance of *Eupithecia oblongata* (*centaureata*) and *Charæas graminis*; got one of each. The following were also taken at light, at Chislehurst, between July 26th and August 31st, but I have no notes of the exact dates:—*Acidalia bisetata*, *A. dimidiata* (*scutulata*), *A. straminata*, *Eupithecia assimilata*, *E. linariata*, *Leucania conigera*, *L. impura*, *Hydræcia micacea*, *Miana arcuosa*, *Caradrina taraxaci* (*blanda*), and a single specimen of *Noctua triangulum*. I also obtained a number of Micros, but these I have not yet had time to work out. On July 13th the following came to light at Chislehurst:—*Porthesia similis* (*auriflua*), *Hadena oleracea*, *Boarmia gemmaria* (*rhomboidaria*), *Leucania lithargyria*, (two—one green and one brown one), *Hemithea strigata*, *Caradrina taraxaci*, *Plusia chrysitis*, *Noctua augur*, *Nomophila noctuella* (*hybridalis*), and a few others.—T. D. A. COCKERELL; 51, Woodstock Road, Bedford Park, W., December 8, 1884.

Lateness of the past Season.—Mr. Harding remarks in the 'Entomologist' (vol. xvii. 185), that after every promise of a remarkably early spring, the bitter east wind of April changed the whole aspect of affairs, whereby the appearance of many species was greatly retarded. Having passed the summer months entomologizing in south-western Spain, I may note that I there observed three butterflies appeared much after the dates assigned in Mr. Kirby's books for their emergence. In the case of *Argynnis pandora*, a very common and conspicuous butterfly in north-western Spain, as *A. aglaia* is in Scotland, there could be no inaccuracy of observation, I think, involved. The newly-emerged males I first noticed in the environs of Valladolid, on the 12th of July, and the species was still flying in the Asturian mountain gorges in August. Kirby's book says June and July.—A. H. Swinton; Binfield House, Waterden Road, Guildford, December 9, 1884.

[Dr. Lang, in his 'Butterflies of Europe,' also gives June and July as the time of appearance of *Argynnis pandora*.—J. T. C.]

Economy of Colias edusa.—The life-history of this species has been so far elucidated as to make it clear the deposition of eggs usually takes place about May, the work being performed by hybernated individuals, as in *Gonepteryx rhamni*. It is possible that in exceptional years a few larvæ might be produced in the autumn, which would pupate ere winter, as Mr. Tutt suggests (Entom. xvii. 270). That, from some peculiarity in the species, the hybernators are apt to die off, has been given as the reason why *C. edusa* is less abundant than *G. rhamni*, though much like it in some respects.—J. R. S. Clifford; Cambrian Grove, Gravesend, December 11, 1884.

Gonepteryx rhamni in Dorsetshire.—I think that Mr. Mansfield (Entom. xvii. 271) is mistaken in thinking that buckthorn is not a Dorsetshire plant. Both the British species of *Rhamni* occur in a native state in the county, and the common buckthorn (*R. catharticus*) is widely distributed, and in some places frequent.—F. Buchanan White; Perth, Dec. 9, 1884.

Late appearance of Hepialus humuli.—At the end of August I netted what I thought was a Noctua, flying oddly over the grass. To my great surprise it proved to be a female *H. humuli*. In so hot a season it could hardly be a late emergence, as the species was quite over the month before. The specimen was in fine condition, but pale in colour, and very small. —J. Sang; 33, Oxford Street, Darlington.

Abnormal appearance of Cucullia verbasci.—I was surprised to find a specimen of *Cucullia verbasci*, just hatched out, in my breeding-cage to-day. It is one of ten larvæ that I found in Hampshire, in July, 1883, all of which went into the pupa state the same autumn, but only three imagos have at present appeared. The two previous specimens hatched in June last.—Percy Rendall; 20, Ladbroke Square, November 21, 1884.

Cidaria flavicinctata double-brooded.—Is *Cidaria flavicinctata* (*ruficinctata*) double-brooded generally? I procured some ova rather late this season in Rannoch. One larva rather quickly outgrew the others, but was by no means full-sized when it turned into a very small chrysalis. A few days ago it came out as a perfect and well-marked moth, rather small, but not much smaller than some I have taken in Rannoch; the others are all very tiny, but I hope to get them through the winter.—(Mrs.) Elizabeth Cross; Appleby Vicarage, Brigg, Nov. 27, 1884.

The Urticating Properties of the Hairs of Porthesia chrysorrhœa.—At least I suppose we must say it is the "hairs," as stated (Entom. xvii. 275), that cause with some persons such peculiar and painful irritation, while others are slightly affected, and others, again, not affected at all. During some years, a long strip of hedge on the old Dover road, between Gravesend and the village of Chalk, was the residence of a colony of *Porthesia chrysorrhœa*, hundreds of their nests, or even thousands, being conspicuous on the hawthorn, blackthorn and hazel. By-passers of both sexes were often, in the summer months, sufferers from the hairs floated by the wind off the larvæ or their cocoons, and it was rather amusing to hear the various conjectures which were made as to the cause of the irritation, never attributing it to the insects on the hedges. I had, in a local journal, more than once advised the removal of these winter nests, in the interest of the adjacent orchards, seeing that this species is reported to be injurious to fruit trees. The farmers and gardeners neglected this, but the extremely wet winters of 1882 and 1883 appear to have extinguished the species for the present. Returning, how- to the matter of the urtication, I might say that, speaking familiarly, there is not a pin to choose between the hairs of *P. chrysorrhœa* and those of *P. similis*, only from the occurrence of the former species in colonies we are more likely to perceive the disagreeable influence of their protective coating. The theory has been put forward (has it not?) that from the scarlet cup-like spot on the tenth segment of the larva a fluid is ejected which irritates, as in the case of *Dicranula vinula*, but I do not think this has been confirmed by dissection. It is amply proved that the cocoons cause irritation, as also the moths, concerning which Mr. Anderson's suggestion is a plausible one. The oddest circumstance is that the hairs of the larvæ seem to set up this irritation, not by puncturing the skin, but by simply lying upon it; of course the irritation once started, is generally increased by rubbing. Perhaps we may suppose that the hairs are beset with numerous fine particles, and these, falling off, are taken up by the pores of the skin. A lotion of arnica, applied cold, will probably be found the best remedy. It may be added that a similar effect has been experienced from the hairs of the larvæ of *Arctia caia* and *A. villica*.—J. R. S. CLIFFORD; Cambrian Grove, Gravesend. —December 11, 1884.

EXCHANGING.—Few of us can hope to form anything like a complete collection of British insects unless we have unlimited time and means at our disposal. Hence the necessity for your Exchange List, which is quite the recognised medium between collectors. The system under which exchanges are effected, among advanced collectors at any rate, is that of "marked lists." Now it is about these that I have a word to say. Does it not stand to reason, that when a collector has obtained full series of more than half the British species, the shortest method, both for himself and his correspondent, will be to place a mark against those species only which he wants? Instead of this, my experience is that if a friend wants, say two species out of a hundred, he will put his mark against ninety-eight and leave the two blank. Let such a person consider the waste of time thus caused to both contracting parties, and mend his ways. If any one knows the value of time, surely it should be an entomologist. To the four virtues required of us in the pursuit of any science—patience, energy, observation, and accuracy—may surely be added a fifth, appreciation of the value of time. In the good old days, when "exchanging" specimens first began, it was comparatively common to see a notice from some prominent collector, offering certain species to be given away to those who would send box and return postage. How rare is such a display of generosity now-a-days! Is it that, twenty or thirty years since, there were so few entomologists that a collector found it difficult to discover "the" man who wanted a particular species; or is it that we are becoming more selfish? Whichever may be the true solution of this question, I do not think certain persons, who have almost complete series of what macros are obtainable, would be injuring their cabinets or themselves if they encouraged beginners or outsiders by distributing a few of their superfluous specimens without expecting a return of any kind. This is surely the best way of promoting our favourite pastime.—(Rev.) Gilbert H. Raynor; Shenfield, Brentwood, October 22, 1884.

Donacia sparganii, *Ahr.*—While sweeping at Esher, on August 5th last, I netted a splendid coleopteron of the genus *Donacia*, and being doubtful as to which species to class it with, I kept it by me until Nov. 20th, when I exhibited several *Donaciæ*, including this one, at the South London Entomological Society's Pocket-box Exhibition. Several coleopterists were present, but as no one seemed to recognise the beetle in question I referred it to your correspondent, the Rev. W. W. Fowler, who kindly replied:—"The *Donacia* is *D. sparganii*, a good species; it is a pity you did not get more, as *Donacia* is usually a gregarious genus." Respecting the gregarious habit of this genus, it may be well to note that I have found this to be generally the case, although I captured but one specimen on the above date, but this is attributable to the fact that I had to suspend operations at noon, and consequently lost the latter portion of the day, which I consider the best time for collecting these beetles.—G. A. Lewcock; 40, Oxford Road, Islington, W., December 15, 1884.

Correction.—Pyrameis huntera not in Essex.—I have pleasure in correcting a statement made by me (Entom. xvii. 41), through the medium of your Journal, that I had captured a specimen of *P. huntera* a few years ago; it turns out to be, as you surmised in your note, the variety of *V. cardui* figured in Newman.—F. H. Barclay; Leyton, Essex.

THE ENTOMOLOGIST.

VOL. XVIII.] FEBRUARY, 1885. [No. 261.

PROTECTIVE RESEMBLANCES IN INSECTS.

By ROLAND TRIMEN, F.R.S., &c.

Prof. Candèze has well observed that the main endeavour of every living being in nature is twofold, viz., on the one hand, to get enough to eat; and, on the other, to escape being eaten. To ensure this double object the most strenuous efforts are made; and it is obvious that, in such a competition for the means of existence, the slightest superiority or advantage must tell in favour of its possessor. Upon a very little difference in strength, swiftness, tenacity, weapons, acuteness of perception, or intelligence, the issue of life or death will depend, where there is enough for one but not for two, or when it is a question of hair-breadth escape from a devouring foe.

It is with regard to these all-important matters of obtaining a sufficiency of food, and escaping being fed upon, that the advantages of disguise and concealment become manifest. If the desert lion finds the advantage which his tawny hair gives him in stealing unobserved upon his prey, none the less does the desert antelope owe his safety to the isabelline colour of his coat. Nothing more strikingly illustrates the uses of concealment than the fact that in the wide unsheltered spaces where there is no cover of any description, all forms of animal life partake of the prevalent colour of the surface,—isabelline on the desert sands, pure white on the arctic snows.

Mr. A. R. Wallace, who has devoted great attention to this subject, and published some excellent papers dealing with it, points out how very generally dwellers among leaves or grass are green; instancing the parrots and green fruit-pigeons among birds, the iguanas and tree snakes among reptiles, and the tree-frogs among amphibians, as prominent cases of the kind. Among insects numbers of species haunting herbage and foliage are green, notably in such familiar groups as grasshoppers and caterpillars.

From such general adaptations to surroundings as those just referred to, we may pass to that of a more specialized kind, which prevails very largely throughout Nature, embracing innumerable cases of more or less exact resemblance in colouring and in surface to inanimate or to vegetable objects. Peculiarities of the soil; of rocks and stones on its surface; of the bark of trees and shrubs; of mosses, lichens, and algæ; of leaves, flowers and stems;—are everywhere reproduced in the aspect of the animals respectively frequenting those objects. It is when absorbed in seeking or taking food, or when sleeping, that most creatures are specially exposed to danger, and it is manifest what protection must be afforded them by more or less similarity to the things about them.

The instances noticed are but samples of the large number known amongst vertebrate animals; and when we proceed to review the vast class of insects and their allies, so numerous are the cases in point that the difficulty is which to select as illustrations. The colour of the bare ground is reproduced in many beetles—in South Africa notably by Curculionidæ and Heteromera,—and in a multitude of grasshoppers and locusts. Some of the latter groups are exactly of the tint of the ground they haunt, so that it is next to impossible to see them as long as they remain motionless. The most specialized case among those known to me of this kind is that of the wingless Acridian genus *Batrachotetrix*, which has more than one representative in South Africa. The best known species, *B. bufo*, has been dubbed the "Stone Grasshopper" by Mrs. Barber, and well deserves the title; for in colouring, granulation of surface, and the singular flatness of the back, it precisely resembles the small stones which lie about on the surface of the ground which it frequents. In a locality near Grahamstown, where this species was numerous, Barber and myself found it most difficult to detect the as it was remarkably sluggish, and hopped but feebly and reluctantly even when we literally kicked it up. A circumstance most worthy of note is that the colouring of this curious grasshopper copies that of the particular little group of stones among which it lives; and I found this to be the case in quite a limited extent of ground, a set of mottled stones occupying a small space having among them *Batrachotetrix* of corresponding tints, while but a little way off a set of uniformly dark or light stones harboured grasshoppers of like hues.

Several South-African butterflies are protected at rest by the similarity of the under-surface of their wings to the ground on which they settle. The beautiful *Junonia cebrene* and *J. clelia* are thus often rendered almost invisible; and as the former species has been observed by Colonel Bowker to be much hunted by lizards, no doubt the resemblance is of considerable service to them. The same kind of protective colouring is shown by many of the small butterflies belonging to the genus *Zeritis*—a very characteristic Cape group.

The bark of trees and the lichens which cling to it find innumerable faithful copyists among insects, whole groups of beetles and moths more or less exactly reproducing each rugosity and tint of their wonted resting-place. The most practised collector will frequently fail to distinguish the best disguised of these insects, which to ordinary eyes are practically invisible.

Mr. Wallace records his obtaining in Borneo one of the "Spectres" or "Walking-stick Insects" (of the orthopterous order), which was covered with foliaceous excrescences of a clear olive-green colour, so as exactly to resemble a stick grown over by a creeping moss or *Jungermannia*. Quite as marvellous an imitation is the widely-known one of the "Leaf Insects" *par excellence*, a genus of the same family, many species of which occur in the islands of the Malayan Archipelago; and it is difficult to believe without close inspection that these species of *Phyllium* are not in reality the leaves of the plants on which they live. In the Karroo districts of this colony there occurs not uncommonly a very fine Walking-Stick Phasma (*Palathus haworthii*), attaining a length of seven or eight inches, which in its quiescent condition precisely simulates the dried-up rough greyish-brown twigs of the dwarf shrubby plants characteristic of the country.

The whole order of the Orthoptera is remarkable for the likeness to vegetation which very many of its members present, even the predaceous *Mantidæ*, or "Hottentot Gods," affording numerous examples, some of which are very striking. One Natalian species *Phyllocrania paradoxa*, is almost as close an imitation of dead leaves as *Phyllium* is of living ones; while the young of *Harpax ocellata*, sent to me alive from D'Urban by Col. Bowker, have an extraordinary resemblance to a purple flower of the composite type. In this latter instance the resemblance is brought about by the position of the flat round abdomen, which is turned upward and backward over the hind and middle parts of the thorax, so that its lower surface, set with a central row and double lateral rows of purple foliaceous expansions, is fully exposed. This case of *Harpax* resembles that mentioned by Mr. Wallace of a Javanese Mantis which exactly resembled the pink flower of an orchid.

We can readily perceive the advantage of this harmless plant-like appearance to such voracious devourers of other insects as the Mantidæ, whose habit it is to remain motionless among vegetation until some unwary prey comes within reach of their long spiny arms.

As already mentioned, the unarmed race of butterflies and moths depends largely upon protective colouring, which, in accordance with the different posture of the wings in repose, is disposed in the former on the under-surface of the hind wings and of such part of the fore wings as is exposed, while in the latter it characterizes the upper surface either of all the wings or of the fore wings only. In South Africa I have noticed various butterflies possessed of this kind of protection in a high degree; such as, for instance, *Melanitis leda*, which rests among dead leaves on the ground in shady places, and is then indistinguishable from them; and the female *Eronia leda*, which settles on the faded bright yellow leaves of the Erythrina tree. Mrs. Barber noticed, near Grahamstown, quite similar behaviour in the conspicuous male *Papilio cenea* (*Merope* auct.), which twice deliberately settled in her garden, as a resting-place during a shower of rain, on a shrub whose yellow and brown seeds and flowers entirely resembled the colouring of the under side of his wings.

But by far the most elaborate imitation of this kind among butterflies is the famous one, so well explained by Mr. Wallace, of the Indian and Malayan *Kallima inachis* and *K. paralekta*. In these species, which on the upper side are deep-blue and orange, the under side copies with perfect accuracy the withered or shrivelled leaves of dead trees or bushes, the imitation going into such details as to reproduce in appearance even the minute fungi or moulds that grow on the leaves! But this is by no means all the extent of the mimicry; the shape of the wings when the insect is at rest exactly representing both the pointed apex and the foot-stalk of the leaf, and the attitude assumed both bringing into prominence these details and concealing such parts as the head and antennæ which might impair the completeness of the deception. To give an idea of the exactness of the imitation, I may mention that Mr. Wallace had a case (which he showed to me) containing one of these butterflies with expanded wings and a number of other specimens at rest in their natural attitude on a branch. When this case was exhibited to anybody not specially acquainted with such matters, it was his wont to ask how many butterflies were in it, and the answer would always be "One"—meaning the conspicuous blue-and-orange individual with outspread wings. Mr. Wallace would then explain the imitation, showing that the apparent leaves on the branch were actually butterflies. But he had cunningly left one real leaf among them, and when, after explanation, he would say, "How many butterflies do you count now?" I believe that almost invariably the answer gave *one too many*, because the real leaf was counted by the spectator as one of the butterflies!

The numerous disguises assumed by Spiders have formed the subject of a special paper by Prof. Pavesi (Atti d. Società Ital. d. Scienze Naturali, vol. xviii., 1875), and among them some of the most interesting are those presented by hunting or wandering spiders, which do not construct webs for netting prey, but trust to their activity or patience. Many species of *Thomisus* are well adapted to succeed by being coloured in resemblance to the flowers in or on which they await the arrival of their victims. One that inhabits Cape Town is of the exact rose-red of the flowers of the Oleander; and, the more effectually to conceal it, the palpi, top of cephalothorax, and four lateral stripes on the abdomen are white, according remarkably with the irregular white markings so frequent on the petals of Nerium.

I was led to notice a yellow spider of the same group, in consequence of seeing that two of a number of butterflies on the flowers of *Senecio pubigera* did not on my approach fly off with their companions. Each of these unfortunates turned out to be in the clutches of a spider, and, when I released them, I observed their captors very narrowly, and found that the latter's close resemblance to the *Senecio* flowers was not one of colour alone, but due also to attitude. This spider, holding on to the flower-stalk by the two hinder pairs of legs, extended the two long front pairs upward and laterally. In this position, it was scarcely possible to believe that it was not a flower seen in profile, the rounded abdomen representing the central mass of florets, and the extended legs the ray-florets; while, to complete the illusion, the femora of the front pair of legs, appressed to the thorax, have each a longitudinal red stripe which represents the ferruginous stripe on the sepals of the flower.

On another occasion I witnessed the actual capture of a small blue butterfly (*Lycœnesthes*) by a white spider of the same genus. The butterfly was engaged in honey-sucking on a white flower-head of *Lantana*, and explored each individual flower with its proboscis. While I was watching it, the butterfly touched and partly walked over what looked like a slightly faded or crumpled flower about the middle of the cluster. This turned out to be a spider, which instantly seized the butterfly, throwing forward its front legs somewhat after the fashion of a Mantis. In this spider the effect of the little depressions on the limb of the corolla was given by some depressed lines on the back of its smooth white abdomen.*

LIFE-HISTORY OF *CHARAGIA VIRESCENS.*

By George Vernon Hudson.

Among the very few Bombycina inhabiting New Zealand, the family Hepialidæ occupy by far the most prominent position, comprising many insects of very large size and conspicuous appearance; of these perhaps *Charagia virescens* is one of the best known, whose life-history I briefly describe in the following paper.

---

* Part of an address delivered at the Annual Meeting of the South African Philosophical Society.

The larva of this insect, unlike most of its family, tunnels the stems of living trees, feeding entirely on wood, which it bites off with its strong mandibles. The plant most usually selected by the caterpillar is *Aristotelia racemosa,* called by the settlers "New Zealand currant," from its large clusters of rich-looking black berries which appear in autumn; in all other respects it does not in the least resemble currant, reminding one more of a tall cherry tree. Other food-plants are numerous, the "black maize" (*Olea apetala*) and "manuka" (*Leptospermum*) being among those more frequently chosen. This larva for the most part inhabits the main stem of the tree, its gallery always having an outlet to the air, which is covered with a curtain of dull brown silk spun exactly level with the surrounding bark, and consequently very inconspicuous; these burrows usually run down towards the ground, and are mostly two or three inches from the surface of the trunk. In some instances the larvæ inhabit branches, in which case, if they are of small dimensions, the tunnels are made near the centre of each. These notes only refer to galleries constructed by young larvæ, as the tunnel made by the insect prior to becoming a pupa is of a very complicated character, and merits a somewhat detailed description; it consists of a spacious, irregular, but shallow, cavity just under the bark, having a large opening to the air, which is entirely closed with a thin silken covering almost exactly the same shape and size as the numerous scars which occur at intervals up the trunks of nearly all the trees. Three large tunnels open into this shallow cavity; one in the centre, which runs into the middle of the stem; and one on each side, which run right and left just under the bark. These are usually very short, but sometimes extend half-way round the tree, and occasionally even join one another on the opposite side. The central tunnel has a slightly upward direction for a short distance inwards, which effectually prevents it from becoming flooded with water; afterwards it pursues an almost horizontal course until it reaches the centre of the tree, when it appears to suddenly terminate. This, however, is not the case, for, if the gallery floor is carefully examined a short distance before its apparent termination, a round trap-door will be found compactly constructed of very hard, smooth silk, corresponding with the surrounding portion of the tunnel so exactly that it almost escapes detection. When this lid is removed a long perpendicular shaft is disclosed, which runs down the middle of the tree to a depth of fourteen or sixteen inches, and is about six lines in diameter; at the bottom of this the elongate *virescens* pupa sleeps quietly and securely in an upright position, the old larval skin forming a soft support for the terminal segment of the pupa to rest on. The upper end of this vertical shaft is lined with silk, which forms a framework on which the trap-door rests when it is closed; the lid itself, being of a larger size than the orifice, which it covers, causes it to be extremely difficult, if not impossible, to open from the exterior, especially when it fits down very closely, which is nearly always the case as long as the insect remains in its burrow. The object of this most ingenious contrivance is in all probability to prevent the ingress of insects; Blattæ, slugs, spiders, and immature "wetas" (*Hemideina*) are frequently found in both central and lateral tunnels, but they are quite unable to pass the trap-door, and are most likely entirely ignorant of the existence of the vertical burrow. When the pupa has left its dwelling it becomes the permanent home of these animals and many others; I have on several occasions found a small orthopterous insect (*Libanasa* (?) *maculifrons*) in the vertical portion of deserted galleries, which has very long antennæ, and is agile in the extreme, leaping out of sight if possible the moment the tunnel is opened; it is a most graceful little insect, and I have never discovered it in any other situation, so conclude that this is its normal habitat.

The galleries of different individual larvæ are all wonderfully alike, the only differences observable being in the length of the perpendicular shaft and direction of the horizontal burrow, which is sometimes curved. These variations are usually caused by the presence of other tunnels in the tree, which the larva invariably avoids, although how the insect can ascertain that he is approaching another tunnel, before he actually reaches it, I cannot understand; I have never known a single instance when a larva has allowed his tunnel to communicate with a neighbouring one, whether inhabited or otherwise.

The caterpillar, when full-grown, is of considerable size, measuring from twenty-eight to thirty lines or more in length;

it is tolerably uniform in thickness throughout, and of a dull yellow colour. The head is large, dark chestnut-brown, very irregularly striated, and covered with a few short yellow bristles. The prothoracic segment is hard and shining, with the back and sides ruddy brown, the ventral surface being dull yellow; its spiracle, which is very large, is situated near the posterior margin, and a little above it there is a dull black spot, filling a slight concavity about the same size as the spiracle itself. The second and third thoracic divisions are without breathing orifices, all the rest of the segments, except the last, being provided with a pair situated in the connecting membrane between them. Each of these has on its dorsal surface two corneous plates of an oblong form with rounded angles, the larger of which is situated on the anterior portion of the segment, except on the second thoracic, where the arrangement is reversed, the smaller one being in front of the other. These plates are all divided into two portions by a dorsal line of soft membrane which runs down the middle of the larva. On the sides of the two posterior thoracic segments there are several small plates of irregular shape resembling those on the back; on each of the abdominal segments there are also two plates of an oval form situated just below the spiracles, and lying one above the other; these are all bright ochre in colour, hard, and shining. The anal segment is entirely corneous, and dull brownish yellow in colour. Prolegs are situated on the third, fourth, fifth, and sixth divisions of the abdomen; they are of a dull yellow hue, and are furnished with a row of very fine black hooks round the edges of that portion applied to the ground. Anal prolegs darker. The whole insect is sparingly covered with isolated yellow and black bristles. In many larvæ the ventral surface and connecting membrane between the horny pieces is light purple. Younger specimens principally differ in being of an olive-green colour, which is considerably darker when they are very small.

The last act performed by the caterpillar previous to undergoing its transformation is the construction of the trap-door at the top of its burrow; this done the insect retreats to the bottom, its last segment resting on the termination of the vertical gallery; after this it becomes torpid and stiff, then violently wriggles, and the skin, splitting open on the thorax, is worked down to the bottom of the burrow underneath the last abdominal segment of the pupa.

The chrysalis of this insect varies much in size, ranging from twenty-four to thirty lines in length; it is of a very attenuated form, the widest portion being through the middle of the thorax; behind this it gradually tapers off towards the extremity, with the last segment abruptly truncated. Its colour is light ruddy ochre, with the head and dorsal portion of the thorax dark brown, and harder than the rest of the body. The edges of the abdominal segments are furnished dorsally with a row of small hooklets above and below all the dividing sutures; on the ventral surface there is only a single one, which is situated in front of each articulation.

As development progresses in the pupa it becomes darker in colour, especially on the wing-cases, which in some individuals show the future black markings of the moth as early as two months before emergence; others remain quite white and soft, the green wings suddenly appearing through their cases a fortnight or three weeks prior to the bursting forth of the imago. Previous to this change the pupa works its way up the vertical tunnel, forces open the trap-door, which yields to the slightest pressure from within, and wriggles along the horizontal burrow until it reaches the air, the last three or four segments only remaining in the tree. The thoracic shield then ruptures, and the moth crawls out and expands its wings in the ordinary way, resting on the trunk of the tree until they are of sufficient strength and hardness for flight.

Although nearly all the "currants" in this locality are perforated by the larvæ of *C. virescens*, I have never yet found a living example in the open, and only twice have discovered remains of them; once a dead crippled specimen at the foot of a tunnelled tree; on another occasion I found a pair of wings belonging to this moth in the middle of a road near Palmerston North. This specimen had evidently been devoured by some bird like its British relative, *Zeuzera æsculi*, whose wings we so often observe on footpaths in the vicinity of London.

Previous to the present year the obscure habits of this insect have prevented me from rearing the moth in captivity, and it was not until I had destroyed several examples of both larvæ pupæ that I discovered the true nature of its burrow.

Since these preliminary disasters I have succeeded in extracting over twelve specimens, six of which died from time to time, three others have just appeared as moths, and the remainder are still alive and healthy, although exhibiting no signs of emergence at present. I therefore conclude that this insect is very delicate in its constitution, taking as I did every precaution with the pupæ, which were placed on rotten wood and covered with a thin layer of damp moss; a similar proportion of deaths occurring among chrysalids in the natural state would be almost sufficient to account for the apparent rarity of the imago.

I will now give a short description of the moth when recently emerged, as most examples seen in collections are so much faded, and frequently mutilated, that very erroneous notions are often entertained respecting the insect's natural appearance.

The fore wings of the male are uniform apple-green in colour, with a series of fainter oval markings, between the longitudinal veins, enclosing a dark green kidney-shaped spot in the centre of each; there is also a diagonal row of obscure white spots near the disc of the wing, and a somewhat conspicuous spot on the costa close to the thorax, of the same colour. The posterior wings are much paler, especially near the body, where they become almost white. The head and thorax are dark green, without markings; the abdomen is white and downy, becoming pale green at the apex, and the antennæ are very minute, of a rusty yellow colour. The legs are robust, dark green striped with blackish purple; the expansion of the wings ranges from three and a half to four inches. The female differs principally in having the wings of a more attenuated shape; the anterior pair are also ornamented with a number of black spots, chiefly situated on the costa, but extending across the wing to its posterior margin near the body. The hind wings differ from those of the male in being light greenish brown, and the basal portion of the abdomen is of the same colour, fading off into dark green on the two terminal segments. The expansion of the wings in this sex varies from four and a half to five and a half inches.

Notwithstanding its large size and conspicuous appearance this is not at all a beautiful insect, its long abdomen and minute antennæ giving it an ungainly and incomplete aspect which is far from pleasing even in the finest specimens.

Before finally concluding this paper I wish to direct the attention of your readers to some caterpillars preserved in the British Museum, and labelled "Larvæ of *Charagia virescens* attacked by a parasitic fungus." These insects are to be found buried in the earth, the fungus growing up out of the ground like a small plant. I have never discovered specimens myself, but have examined several obtained by others; in all these the parasite grew out of the connecting membrane between the head and prothorax, and projected somewhat forwards; the larvæ are also much shrivelled, and consequently unrecognisable; but being found invariably in the earth and not in the stems of trees, it seems more probable that they are the subterranean larvæ of one of the other large Hepialidæ than those of the present insect. I have never heard of infested specimens being found alive, or anything at all resembling them; but as no systematic research has been at present brought to bear on the subject it is impossible to say to what species they belong, especially as the most absurd ideas are entertained by many persons respecting the origin of the fungus, some positively asserting that the caterpillar devours the seed of the "rata" tree (*Metrosideros robusta*), and then buries itself, the young tree afterwards growing up out of the larva which it destroys!

Karori, Wellington, New Zealand, August 31, 1884.

A YEAR'S WORK AMONG GALL-GNATS.

By Peter Inchbald, F.L.S.

We learn from Bergenstamm's pamphlet on the Gall-gnats, 'Synopsis Cecidomyidarum,' published in Vienna, in 1876, that 600 species, *duly named*, exist in the world. A very large proportion of these Cecidomyidæ occur in Europe, and of these 75 have been tabulated by Mr. Fitch as having been noticed in Great Britain. I would draw attention to his admirable Synopsis, which appeared in the 'Entomologist,' July, 1880 (vol. xiii., pp. 140–154). Mr. Fitch has taken Bergenstamm's Synopsis as his model, but his own personal experience has given additional interest to his list, and his introductory remarks should be diligently read and studied by every investigator of Cecid-life.

I have pleasure in submitting to your readers my year's doings among this most fascinating group of insects, and could only wish that I had more to record than I have. Long years are needed to elucidate fully the habits of these tiny gall-makers among our Diptera.

The first Cecid of the year is the little gnat that comes forth from the last year's catkins of the birch (*Cecidomyia betulæ*). I have reared them abundantly both this season and last. They appear in March, or early in April, if the morning is sunny. The contorted wings are unfolded in about twenty minutes, when they begin their merry gnat-like dance. You must be an early riser to notice the transformation scene.

No sooner does the cuckoo-flower (*Cardamine pratensis*) show its flower-buds than they are tenanted by the larvæ of *Cecidomyia cardaminis*, half-a-dozen or more occupying one bud, and making it assume such monstrous proportions as sometimes to be hardly recognised as the bud of our bonnie cuckoo-flower. After years of failure I succeeded this year in raising the gnat from the affected flower-heads of last year. Moisture is essential for its development; so that the flowerpot that contains the larvæ should stand in a saucer constantly supplied with water. I know no other secrets in rearing this merry little Cecid. Winnertz says that he only reared it after long years of disappointment. As the summer comes round, another gnat-gall covers the surface of the leaves of the meadowsweet (*Spiræa ulmaria*) with red and green warts. These are the home of the larvæ of *C. ulmariæ*, and an abundant progeny may be reared therefrom by closely imitating Nature in her ways and means. The warts of this species are rounded on the obverse, pointed on the reverse, of the leaf. Each contains a single larva. July is the month in which they appear in the winged state, the first flight appearing about the middle of the month. I must have reared fully a hundred.

It is well to remember that the Cecids, as a group, are lovers of moisture, so that it is necessary, to succeed in rearing them, to sprinkle the food-plants with water each morning. Professor Loew (of Posen) remarks, in his monograph on the Cecids, that the larvæ of these minute forms of insect-life may be resuscitated even when apparently dead and shrivelled. This remark has often helped me, in my investigations, in educing the perfected existences.

Our ash-trees in Yorkshire have this y Cecid larva that causes sausage-like swell the leaflets. Bremi of Zurich figured tl graph in 1847, though he did not rear t larvæ lie ensconced in the sausage-like continuous succession. When full-fed in the gall splits longitudinally, and the burrowing into the soil. I hope to r about the time the ash puts forth its le Cecid is *Diplosis betularia.* I reared thi *Cecidomyia veronicæ* from terminal g The economy of the larva is identical, th shoots being inspissated, and adapted offspring. I had some hope that the the nidus might be distinct, but Dr. M identical. The densely hairy pouch o itself into a perfectly smooth pouch might naturally be expected.

Everyone must have noticed, in hi the leafy bosses on the top shoots These contain several larvæ of the *C.* phosis is mostly external, though occas within the boss itself, as Mr. Fitch r reared this Cecid, though recorded y hope to be successful in the spring o April. The leaves are thickened by gnats, and thus made to supply food a coloured larva, which feeds otherwise un tuft. Numbers pupated in my glass-top

Another Cecid I have often tried to

ORIENTAL ENTOMOLOGY.

By the Rev. F. A. Walker, D.D.

(Continued from p. 9.)

During my first visit to the East I captured 38 species of Coleoptera in Greece, 34 in Asia Minor, 21 in Syria, 18 in Palestine, 15 in Turkey, 7 in Egypt. On my second expedition I only captured 8 species of Coleoptera, 5 in Egypt and 3 in Nubia.

The difference in the number of species respectively noticed in the different countries may possibly be attributable, to some extent, to the time of year when the various localities were visited; and there are additional grounds for entertaining this hypothesis in the fact that the later the period the larger the number of species proved: for example, 7 in Egypt (in the month of March), 18 in Palestine (March—April), 21 in Syria (April), 34 in Asia Minor (May), and 38 in Greece (May—June). Only 13, it is true, were noticed in Turkey in the month of May, for the simple reason that a great part of my time was spent in visiting the public buildings, instead of in the open country. The genus *Oxythyrea* had a wide range, occurring alike in Palestine, Syria, Asia Minor, Turkey, and Greece. Two species of this tribe were found in great abundance, viz., *cinctella* and *hirtella*, and for the most part, as was also the case with many of the Cetonias, when tightly ensconced in the middle of a flower. I never saw any kind of beetle anywhere in such countless profusion as the showy orange and black-spotted *Mylabris quadripunctata*, on the ears of ripe corn, during our return drive from Deceleia on the 1st of June, at the close of a bright and hot day. Some few good sorts were found beneath stones; seven specimens, for example, of the rare *Nebria hemprichii*, at Aceldama, on April 3rd, and *Chlænius spoliatus*, *C. vestitus*, *Anchomenus austriacus*, and such like metallic Coleoptera on the wet ground in the vicinity of the Great Bend or reservoir of Sultan Selim, that had recently overflowed its boundary on the 25th of May, at Belgrade. *Anthia sex-maculata* (variegated black and white) is the handsomest, decidedly so, of the very few species I saw in all Egypt, and was taken running about the sand heaps that are silted up by the action of the desert winds, among the swamps of [illegible] at El Ferdane and elsewhere, in the neighbourhood of the Suez Canal. [illegible] near the [illegible] of the [illegible] were found also in the Desert, and at the Pyramids of [illegible], but the more plentifully on the road to [illegible] and Marathon, two and a half months later.

Of the large species of Coleoptera that I came across on my [illegible] visit to Cairo, and in my voyage up the Nile, one was beautiful, *[illegible] squamosa*, one of the green metallic Buprestidae, and of this bright-coloured beetle there were [illegible], as it swarms in the [illegible] (January—March) at Erment, the ancient Hermonthis, a short distance up the river south of Luxor; and at this latter place a large number had been stored since the preceding season, in a terra-cotta gourd, for sale to tourists in December.

Respecting Orthoptera there is comparatively little to relate. I discovered the red variety of *Œdipoda germanica* to be as widely distributed in the East as previous experience had made me acquainted with its occurrence in Switzerland, Italy, and Corsica; for I found it on the banks of the Pharpar on the 19th of April, where it took its short flights amid the corn; and again in the neighbourhood of Alexandretta, in the direction of [illegible], on the [illegible] of the same month, as we toiled up among the myrtles, pomegranates, Portugal laurels, and styrax trees, beneath a very hot sun, to the ruins of the old castle of Merkes, two hundred yards from the shore; and lastly, I noticed it on the road leading to Marathon, on the 5th of June, as also previously at Belgrade, on the 28th of May.

Acridium tataricum, a locust with smoky brown wings, likewise a common species in Italy and Corsica, was also found near Alexandretta, on the road to Marathon, and at Beyrout as well.

Of *Mantis religiosa* I obtained a specimen off the orange trees in the Island of Roda, in March, and another clinging to a bough of *Ficus elasticus* was brought me at Beyrout in April.

There are also several grasshoppers that I collected in Palestine, Syria, Asia Minor, Turkey and Greece, chiefly in the last-named country, but which, if differing in kind, do not differ in their light brown or dust-coloured hue, as well as general appearance, from our common field grasshoppers at home. They are at present unnamed, as there is little use in taking Orthoptera for comparison with those in the National Collection. What I take to be mole-crickets were found in the classic regions of the Pnyx.

I have two small specimens of the larva of a *Mantis* belonging possibly to the genus *Eremiaphila*, and bearing out its title in its natural habitat, as it was scarcely distinguishable in hue from the desert sand of Gebel Hashab, where I discovered it on the 22nd of March.

Lastly, the mention of a remarkable-looking insect, *Callimenus oniscus*, must not be omitted. It is a wingless locust that keeps up an incessant and shrill chirp, in the underwood of myrtle and cistus, &c., on either side of the roads to Laurium and Marathon. As it hushes its strain when approached, it is not always easy to detect its presence, more particularly as its ground colour is a bright apple-green, traversed by numerous horizontal bars of black across the body. This beautiful colouring, however, is turned to brown after its inevitable consignment to a wide-mouthed phial of spirits. It no doubt derives its specific name of ὄνισκος, "the little ass," in consequence of its similarity, from a dorsal point of view, to that beast of burden.

(To be continued.)

URTICATING PROPERTIES OF LEPIDOPTERA.

I HAD hoped that my note of inquiry on this subject (Entom. xvii. 256) would have elicited something more definite as to the cause of urtication than it has done. But at any rate the correspondence it has provoked has incontestibly proved one fact, *viz.*, that *Porthesia similis* and *P. chrysorrhœa* are capable of producing urticaria in all stages of their development. No doubt the same may be said with equal truth of other species which have hairy larvæ, and I think it is quite as certain that the poisonous property (whatever it is) can reach the face, &c., without the assistance of the hands.

In my former communication I purposely refrained from advancing any theory of my own, my purpose being rather to draw forth information from others who I hoped to find had studied the subject. I may now say that my opinion at the time was—and still is—that the dust surrounding the cocoon, and which is wonderfully light, and set floating in the air by the slightest touch, is the medium by which the poison—for poison undoubtedly it is—is conveyed to the skin.

I find from an exhaustive and thoughtful paper in 'Psyche' (vol. iii., nos. 101 & 102), the organ of the Cambridge (Mass. U.S.A.) Entomological Club, which the editor, George Dimmock, Esq., has kindly sent me since my note appeared in the 'Entomologist,' that both American and Continental scientists appear to be ahead of us in this branch of Entomology.

Perhaps I may be excused, considering the paucity of information which we appear to possess on this subject, for making a few quotations from Mr. Dimmock's paper "On some glands which open externally on insects." Speaking of the larva of *Attacus cecropia* (and there is a strong presumption that what is true of one hairy larva is true, in a more or less degree, of others), he says:—"The red tubercles are seen, in sections cut with the microtome, to be divided into compartments, the cavities of each spine opening into a compartment at its basal end. The spines themselves are quite rigid and very brittle, so that they break away at a slight touch and leave a hole in the tubercle, out of which an odorous fluid pours, pushed by internal pressure. This fluid is strongly acid to litmus paper. The odour given out by these glands suggests at once their protective functions. . . . Glands similar to those of the larva of *Attacus cecropia*, in that they have no outlet until one is produced by external agency, are not rare in the larvæ of Bombycidæ. The severe poisoning produced by the hairs of certain larvæ of Bombycidæ, of which the so-called processionary caterpillar of Europe is an example, *is caused by the secretion from a minute gland at the base of each hair*. The secretion of these glands fills the hollow central portions of the hairs, and when the sharp, often barbed, hairs are broken in the flesh of attacking animals, the broken parts carry with them the poisonous secretion. This secretion is, perhaps, formic acid, or a formate in solution."

As Mr. South mentions *Cnethocampa* (Entom. xviii. 5) I give the following:—"Goossens regards the spines of the larvæ of *Cnethocampa* to be poisonous because of a powder produced by the drying of the secretion given out by the evaginable glands the dorsum of these larvæ. This view seems unacceptable after Karsten, Keller and others have so clearly proved the presence of glands at the bases of the spines of these stinging larvæ."

And very much more, all tending to prove what Mr. South says he has only seen suggested by Mr. Swinton, *viz.*, that underneath the warts, on the hinder segments, glands are situated which secrete a poisonous fluid, which is forced in minute drops through the spines.

Coming to the insects we have lately had under consideration, Mr. Dimmock goes on to say, "The structure of the evaginable warts and their glands in *Leucoma silicis* will answer in a general way for the similar warts of *Orgyia* and of the European *Liparis.* The wart is protruded by pressure of the fluids within the body, and retracted by muscles; at or near its centre open the ducts of one or two glands which are situated beneath the warts. The position and general structure of these glands, as well as their motion when the larvæ are disturbed, indicate that they are defensive in function."

Just one more slight extract, which appears to throw a little light upon the mode in which the imago causes urtication:—"Still another form of gland is that at the anterior end of certain *bombycid* pupæ, which breaks when the imago springs the chitinous pupal skin, and leaves its secretion, which has been termed bombycic acid, on the head of the moth."

I trust these few extracts will give a fresh impetus to the investigations of those gentlemen who have the time and means of successfully following up this inquiry.

GEORGE BALDING.

Ruby Street, Wisbech, January, 1884.

THROUGH the courtesy of Mr. Geo. Dimmock I have been favoured with a copy of the American publication 'Psyche,' vol. iii, No. 101, 102, containing a valuable and interesting paper by that gentleman—one of the editors—"on some glands which open externally on insects," in which are some observations showing that the urticating properties of certain lepidopterous larvæ are due to the glandular hairs, somewhat of the nature of those of the stinging-nettle.

For every effect there is a cause, and the irritation produced by some caterpillars is a fact which cannot be gainsaid. It therefore would be time profitably employed by any lepidopterist in investigating the subject. Experience proves that it is not all hairy larvæ which possess this painful property; nay, that it is confined to comparatively few of them. Why is this? It seems rather humiliating to entomologists of our own country that, with almost one exception (that of Mr. Swinton), no researches have been made which show any light upon what has too long remained a "quæstio vexata," and that to learn anything respecting urtication we must go to our friends in America, or it may be here and there a Continental authority. Mr. Dimmock has evidently bestowed much labour upon the subject himself, and has sought for information from every available source. To show what has been done in America the following short quotations may be serviceable to many of the readers of the 'Entomologist':—

"Karsten, in 1848, described the anatomy of the poison-glands at the base of the hairs of an American species of *Saturnia.* Five illustrations of this kind of gland are to be found in the stinging hairs of the larvæ of *Hyperchiria io* and *Hemileuca maiæ*, both common insects in parts of the United States. Lintner and Riley have recorded their experiments in the stinging power of these two species of larvæ, and the latter writer has given a list of the larvæ of American species of Lepidoptera which are known to sting. Lintner has experimented further upon the stinging power of the larvæ of *Lagoa crispata*, and Miss Murtfeldt upon that of the larvæ of *Lagoa opercularis*. That the sting of some of these larvæ can do lasting injury is certain, for my mother, when twenty-seven years old, received so severe a sting in the middle finger of one hand in brushing away a larva from her neck, that the distal joint, healing only after several months, remains somewhat stiffened and slightly deformed, now thirty-seven years. For a time the stinging of these bombycid larvæ was attributed to the action of the hairs in entering and wandering about in the flesh; and even as late as 1881, long after the discovery of the glands at the base of the hairs, Goossens advances the idea that the poison of the processionary caterpillar of Europe comes from other glands. Keller, in 1883, discusses the mode of urtication in the processionary caterpillar (larvæ of *Gastropacha*), and figures the glands at the bases of the thin hairs."

Surely some British Entomologist is capable of verifying these statements, and bringing the question to a definite conclusion.

JOSEPH ANDERSON, JUN.

Chichester, January 8th, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SCIENTIFIC NOMENCLATURE AND DR. LANG'S EUROPEAN BUTTERFLIES.—The recent criticisms on the 'Entomologist' Synonymic List of British Lepidoptera, as well as the review of Dr. Lang's beautifully illustrated work on the European Rhopalocera (Entom. xvii. 284), induces me to ask information on a few points of nomenclature, &c. I observe that in Mr. South's List *Epinephile hyperanthus* has become *E. hyperanthes;* and *Argynnis lathonia, A. latona.* Now, for my own part, in opposition to the criticism in a contemporary, I quite concur in the propriety of altering a mis-spelt name, when it is clear that the error was a sin of ignorance or carelessness on the part of the godfather; but there is, nevertheless, such a thing as being philologically hypercritical, which I am inclined to think the first change is. Now *hyperanthus* may not be correct as a Greek derivation, for I presume this is what is meant by the suggested emendation; but perhaps the author merely Latinized ὑπερ ανθεος, in which case the termination might stand. With the second correction, however, I quite coincide, as being certain to be eventually adopted, as there can be little doubt that the beautiful goddess stood gossip to this shining insect, although I am puzzled by Dr. Staudinger's "recte Latonia." In Dr. Lang's 'Rhopalocera Europæ' there are various departures from the recognised orthography, and, as he has deviated very rarely from Dr. Staudinger's nomenclature, it would be interesting to know the grounds of these departures. On p. 103 a var. of *Lycæna ægon* is given as "*argryrotoxus,*" Berg.; and on p. 105 is *L. argus* ab. "*argyronomon,*" Berg. Is not the adjectival prefix the same in both names, seeing that both were given by the same author? And if αργυρος be not, what is the adjective intended? The latter name is spelt by most authorities, "*argyrognomon.*" Is there any indication whether γνωμον, the index of a sundial, or νομος, a shepherd, was meant by Bergsträsser? On p. 245 a var. of *Erebia œme*, "*psodea*," Frr., is given, while Staudinger substitutes *spodea*, there being already a *psodea*, Hb., var. of *E. medusa*. Surely this is not only admissible but advantageous? On p. 208, *Argynnis elisa*, Godt., is given as "*eliza*." On what grounds? On p. 312, *C. typhon* var. *rothliebi* becomes "*rothliebii*"; and, at p. 233, the var. *herta*, Hb., of *Melanargia larissa*, "*hertha*." At p. 354, ab. *catena*, Stgr., is given as "*catæna*"; and *nostrodamus*, F., as "*nostradamus*," the latter being, if my memory serves me, the correct spelling. At p. 290, *mæra* becomes "*mœra*"—on what proof? and *thanaos*, Bdv., "*thaunaos*." Not having access to the works of the earlier entomological authors, I am unable to seek out the data upon which Dr. Lang relies. There are also scattered throughout the work various misprints not included in the errata, which, for the benefit of those who possess the volume, I will indicate under correction:—P. 125, "*Menaclas*" (*Menalcas*); p. 147, "Trappe" (Trapp); p. 155, "Heyères" (Hyères); p. 202, "*freija*, Thub." (Thnb.). Query, would it not be better to print this name *freiia* in an English work, as is done in *Deione* for *Dejone*, *Aglaia* for *Aglaja*, *Iolas* for *Jolas*, &c.? P. 245, "Puy de Saucy" (Sancy); p. 262, "*livonica*" (*livonia*); and on Pl. LXIII. is "var. *pithio*, Hb." (*pitho*, Hb.). I notice, too, that Dr. Lang denies the occurrence of *C. edusa* and *E. epiphron* v. *cassiope* in Ireland. The rarity of Dr. Birchall's List no doubt accounts for these mis-statements; but I should be interested to know whether Cistus is correctly given as the food-plant of *C. myrmidone*. In conclusion, perhaps I may be allowed to bear my testimony to the admirable style in which the illustrations have been brought out, their accuracy of tint—even in the *Lycænidæ* and other genera difficult to produce satisfactory facsimiles of—exceeding, in my opinion, any that have hitherto appeared in previous works on European Entomology. In the *Hesperiidæ* only I think some characteristic markings have in some instances been omitted; and no wonder, for some of this family remain a puzzle to the best Lepidopterologists.—W. F. de V. Kane; Dec., 1884.

Scientific Nomenclature.—Now that Mr. South has published his new synonymic list of all Lepidoptera which have hitherto been taken in this country, it is a good opportunity to protest against the habit of naming new species after individuals, which some entomologists have adopted. To take, as an example, the new *Eupithecia* described in your columns last October; Mr. C. S. Gregson (who, by the way, says in his recent book on the subject that "anything will do for a name") has called it *Eupithecia curzoni.* This is not good Latin, and should, of course, have been *curzonensis;* yet, according to the "inexorable law of priority," or at least according to Dr. Staudinger's canon (referred to by Mr. South in his preface), the species must remain *E curzoni* till the end of time, in spite of the fact that the Latin is bad, and the name about as meaningless as a name can possibly be. This is the weakness of the law of priority. A bad name once given can never be changed for a good one. Confusion is thereby certainly avoided, yet it is very doubtful whether science is bettered. But why did Mr. Gregson call the species *curzoni* at all? He gives us his reason; he named it in honour of his friend Mr. Roper-Curzon, from whom he received a most liberal supply of perfect insects and larvæ. All honour where honour is due certainly, but it is, all the same, a very bad principle of naming to call a species after an individual. If such a principle were generally adopted, then anything would do for a name so long as it had a Latin termination. Is the name to have any meaning? If not, a system of giving a number or letter to each species, such as is in vogue with astronomers for denoting particular stars, would be the simplest, shortest, and most methodical. But if the specific name is to have any meaning at all, it ought to have as much meaning as possible. Now when an insect is named after an individual, *e.g.*, *Pieris spilleri*, recently described in the 'Entomologist,' we learn nothing about it from its name beyond the mere fact that a certain collector some time or other had the good luck to be the first to capture it. Perhaps to infer even so much as that from the name would be wrong, *e.g.*, when one entomologist, describing a species, gives it a name in honour of a friend. A name should, if possible, serve as a description, as it does roughly in the cases of *Vanessa c-album*, *Smerinthus ocellatus*, *Macroglossa bombyliformis*, *Plusia gamma*, &c. It may be difficult nowadays to find a descriptive epithet for a new species which is not already in use; but this should, whenever possible, be our principle in nomenclature. Failing this, the insects can be called after a marked or peculiar habit, *e.g.*, *Odonestis potatoria*, or after the usual food-plant, as has been done in the case of *Thecla pruni*, *T. quercus*, *T. rubi*, *Sphinx convolvuli*, *ligustri*, &c.; or, again, where the insect's range is not wide, after the particular locality in which it is found. But it should only be our very last resource to call a species after an individual. It is true that in what may be described as prescientific days names were given which were drawn from ancient mythology, *e.g.*, *Argynnis selene*, *A. latona*, *Lycæna davus*, *L. corydon*, *L. arion*, &c.; but such names, though apparently meaningless, have, to my ear, at any rate, a classical ring about them which makes them acceptable, but which such names as *E. curzoni* or *P. spilleri* altogether lack. Would it not be best, if the discoverer of a new species were denied the absolute right to give the name, but might only suggest it, and the name to be adopted by English entomologists be definitely fixed by some authoritative scientific association, which would take care that improper names were never recognised? Probably the London Society, or the editorial staff of the 'Entomologist,' would be the proper body to regulate all new cases of nomenclature.—A. CHITTY; Balliol College, Oxford, and 33, Queen's-Gate Gardens, S.W., December, 1884.

EXCHANGING.—The Rev. Gilbert H. Raynor, speaking of marked lists, advocates placing a mark against our desiderata, leaving blank those species we do not require. Assuming, for the sake of argument, that the British species number 2000, if we adopt the plan of marking off those we are not wanting, by the time our collection is complete, clearly we shall have made 2000 marks. Let us now look at the other side. The Reverend gentleman takes an extreme case when the desiderata are but 2 per cent. I will take the other extreme, and suppose an entomologist possessing full series of 1001 species commences to exchange. To complete his list he will have made 999 marks, and 999 erasures or other marks, a proceeding which would at least be no more speedy than the making of 2000 marks, to say nothing of the appearance of the list. After all, in preparing a list for exchange, it is not the mechanical act of marking which takes the time, but the consideration required to mark off the right species, and I have always found the pen to keep pace with the mind in this matter. Some people use a list with the species numbered consecutively, such as Staudinger's; one's duplicates or desiderata are then quoted by number, an arrangement which answers well enough in certain cases. There is still, however, room for improvement, and anyone who can introduce a plan curtailing the immense labour involved in conducting an active correspondence and exchange will deserve well of his brethren. We must all agree with Mr. Raynor in his remarks upon the great value of time. To the student, the true worker, time is more than money or anything else besides, and it is from a deep conviction of this important truth that I am unable to subscribe to the following sentiment:—"In the good old days, when 'exchanging' specimens first began, it was comparatively common to see a notice from some prominent collector, offering certain species to be given away to those who would send box and return postage. How rare is such a display of generosity now-a-days!" Quite so! perhaps we are wiser in our generation. The advocates of such promiscuous generosity should give it a full trial. I apprehend there would be little difficulty in disposing of a few "*Apatura iris*," or any other good thing on those terms. But who is to benefit by the transaction?—to receive the product of our most precious time? Not our old and valued correspondents, but "beginners and outsiders," we are told. Surely beginners want no encouragement. For them all is novelty and excitement. If they are made of the right stuff they will come to the front in spite of difficulties and disappointments; if they are not, no encouragement will raise them above respectable mediocrity, and of these we always have enough. For "outsiders" and dabblers I entertain the heartiest contempt. Their knowledge of our science is of the most superficial and elementary character, for which, in itself, they are not to be condemned, but they make no advance; they have attained maturity. Year after year they pursue the same attractive species, which are often hunted to death. *Eupithecia* is neglected; *Crambus* ignored, and *Scoparia* unknown. What care they for the wonders of *Bucculatrix*, the beauties of *Nepticula*, or the marvels of adaptation exhibited by the endless *Coleophoræ*? Is not *Dominula* still to be had? And what a fine picture it makes with the "marbled white" for a border! Of these people we have more than enough. Let them go their way. I will not encourage them; but the tried correspondent—the genuine naturalist—is welcome to all I have.—Geo. Coverdale; 24, Fleming Road, Lorrimore Square, S.E.

Exchanging.—Until recently my own exchange list was embellished with the prevailing marks against complete series; but one of my correspondents favouring me with his marked list, I was much struck with his method, and at once adopted it. As I think it could hardly be improved upon, I venture to give particulars. Complete series are left unmarked, incomplete have a cross, and a stroke is put against species unrepresented in the collection, which stroke is crossed when a specimen or specimens are obtained, and when a series is completed the cross is surrounded by a circle. The list thus stands: *Complete*, no mark or *. *Incomplete* +. *None* —. This is a very simple arrangement, and, I think, would meet the approval of your correspondents. With reference to the concluding portion of Mr. Raynor's paragraph (Entom. xviii. 23), I think the secret lies in the fact of the very large increase in the number of collectors. At the same time I feel sure there are yet many who would feel pleasure in assisting others in the manner described. Will your correspondent lead the way?—E. Sabine, 17, The Villas, Erith.

Time of Appearance of Argynnis pandora.—In the last number of the 'Entomologist' (p. 21) a correspondent refers to the time of appearance of *Argynnis pandora.* Most authors give June and July as the period when this species appears in the imaginal state. Some, however, as Herrich-Schaffer, only mention June. An example from the collection of the late Sir Sidney Saunders is ticketed "Yanina, June." I believe that I have given correctly its normal times of appearance in my work as referred to by Mr. Carrington. But it must be recollected that the evolution of the imagines in this genus is hastened or retarded by the forwardness or lateness of the season. For instance, the normal time of appearance of *A. adippe* in this district is about the middle of July; yet in forward seasons it will occasionally appear nearly a month earlier; on the other hand, it is sometimes the end of July before it makes its appearance, fresh specimens being obtainable till the middle of August. Almost the same may be said of *Argynnis paphia.* Again, altitude has a very marked effect. I have taken *A. adippe* and *A. aglaia* in a perfectly fresh condition at the beginning of September in rather elevated localities in Switzerland, whereas in the lower-lying places they would by that time have ceased to appear on the wing for a month. I think it is most probable, though I have never taken the species, that *Argynnis pandora* is influenced, in a manner similar to that seen in its immediate congeners of the Palæarctic fauna, by temperature and elevation.—HENRY C. LANG; Maidenhead, Berks, January 26, 1885.

SOARING HABIT OF VANESSA ATALANTA.—Whilst coaching from Bettws-y-coed to Capel Curig, N. Wales, in September last, I observed large numbers of this species, which was very common generally, rise from the branches of ashes and oaks as we passed. Every few yards two or three of the insects were disturbed, and soared to a considerable height, like *Apatura iris*, the resemblance to whose flight was strikingly similar, a fact I had never previously noted or seen recorded.—MARTIN J. HARDING; Old Bank, Shrewsbury, December 21, 1884.

ABUNDANCE OF VANESSA ATALANTA AND V. CARDUI.—With regard to Miss Hinchcliff's note (Entom. xvii. 271) on these species, I may say that both have been particularly numerous in North Kent through the summer of 1884, a circumstance more noteworthy, because it has not, on the whole, been at all a good season for butterflies. Several of the usually abundant species have been excessively scarce; one of the oddest disappearances, not merely in 1884, but for several years past, is that of *Vanessa io*, which was so familiar to us amid the cliffs and chalk-pits, delighting in the bloom of thistles and brambles.—J. R. S. CLIFFORD; Cambrian Grove, Gravesend, December 11, 1884.

LEPIDOPTERA IN SOMERSETSHIRE.—It has again been a barren year for collectors in this part of the West of England. *Vanessa cardui* and *V. atalanta* were exceptionally common, almost every other species of Lepidoptera especially rare. At sugar, although I persevered until late in October, only one species appeared in any numbers; my old acquaintance *Polia flavicincta*, even *Anchocelis pistacina*, *Triphæna pronuba*, *Phlogophora meticulosa*, and such-like common insects appeared but sparsely. Of course *Xylina semibrunnea* and *X. socia* (*petrificata*) were looked for in vain.—H. W. LIVETT; Wells, Somerset, December, 1884.

EUPITHECIA LINARIATA AND ACIDALIA VIRGULARIA DOUBLE-BROODED.—The past season, owing to its intense heat, was undoubtedly favourable to the development of second broods of insects which generally appear but once in the year. Yet how very partial this second appearance must have been is shown by the fact that, although something like a hundred pupæ of *E. linariata* resulted from larvæ I took at Hazeleigh, in September last, only one of these produced an imago. When this emerged I cannot exactly say, as I only found it to-day. It would, no doubt, be before the middle of November, when the cold weather set in. I think the fact worth recording, as the pupæ were left in a room where there has been no fire, and my experience with the species is that even when the pupæ are kept in a warm place they never emerge before their natural time of appearance, in June. Some Eupitheciæ may easily be forced, as, for instance, *E. albipunctata,* which, when subjected to a warmer temperature than usual, emerges regularly in February and March. With regard to *Acidalia virgularia* (*incanata*), I took a single specimen at light, at Brentwood, towards the end of October. Many of the Acidaliæ are partially double-brooded when reared in captivity, but I think this is rarely the case with them in a state of nature.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, December 26, 1884.

EUPITHECIA CURZONI.—In vol. xvii. of the 'Entomologist' (p. 230) is a description of this species, which is fully and carefully described throughout the various stages of its life-history, together with some remarks thereon, one remark being that this is probably the insect figured in the 'Entomologist' (vol. xiv. plate 1, figs. 2 and 3, &c.). If, after reading this description and these remarks, and seeing these figures, anyone can "have a strong opinion" that this species "is nothing more or less than a variety of *E. nanata*" (see Entom xvii. 277), I need only say that it does not follow because he is blind to specific differences that other people cannot see them. As to the writer having sent his specimens of this species "to our most eminent entomologists, who all agreed with him in considering it to be a very interesting form of *E. nanata,*" I have nothing to say, but that if our most eminent entomologists merely agree with him in "his strong opinion," but know nothing of the fact that it is a distinct good species, then I may perhaps be allowed to say that I do not esteem very highly the mere opinions of naturalists, however eminent they may be thought to be, if their opinions do not agree with the natural-history facts known to me. In reply to line 17 (Entom. xvii. 277), I may say

I usually base my conclusions upon my own observations, or upon the observations and conclusions of other careful observers, and not upon mere opinions. The interesting footnote on the page just referred to has but one fault—it is too short. Will the Editor of the 'Entomologist" give us a translation of August Hoffman's paper on the Lepidoptera of the Shetland Isles in an early 'Entomologist?' I am sure everybody would be delighted. It is hardly fair that your readers should be left in doubt by A. Hoffman, Dr. Staudinger, and E. A. Fitch, all first-rate entomologists, yet are to be bound by the mere opinion of an insect collector who evidently does not know the larva of the common species *Eupithecia nanata*, which is a long, cylindrical (tapering to the head), often day-feeding larva, with dorsal lozenges all along its back, and which cuts a round hole into the flowers of *Calluna vulgaris* to get at the stamens; from an appressed (tapering to head and anus from the central segments) wrinkled larva which feeds at night on the lower branches, eating the leaves and caring little for the flowers of the same plant. I need scarcely call attention to the trivial name of *E. nanata*, "the narrow-winged pug;" anyone looking at figs. 2 and 3 of the plate will see that the draughtsman realized that *E. curzoni* is not a narrow-winged pug, but exactly the shape of *Eupithecia satyrata*. When looking over Mr. Curzon's captures here, he again called my attention, as he had before done by letter, to the fact that hardly two of his long series of *E. curzoni* were alike, and that very often the two upper wings differed in pattern—see the figures named above, where the artist has carefully hit this peculiarity off. Now for *E. nanata*, I do not know a more constant pug. I have only seen three varieties of it; they are all in my cabinet, but only one of them is a striking variety; yet I have bred and looked carefully over many thousands of bred and captured specimens for varieties. *Nanata* larvæ can be swept off heather flowers in profusion during afternoons. Mr. Curzon swept for *curzoni* larvæ at Unst day and night, but never obtained one by that process.—C. S. GREGSON; Rose Bank, Fletcher Grove, Liverpool, December 17, 1884.

NOTE ON THE LARVA OF STILBIA ANOMALA.—Although Dr. W. S. Riding obtained his eggs of *Stilbia anomala* from several moths (Entom. xviii. 1), it is evident he only succeeded in rearing one variety of the larva from them. There is another very distinct form, having the ground colour bright pea-green. Descriptions of both may be found in the Ent. Mo. Mag. for February, 1880, p. 210.—GEO. T. PORRITT; Huddersfield, January 3, 1885.

LUPERINA GUENEEI AND L. DUMERILII.—I see *L. gueneei* is omitted in Mr. South's list; at least I cannot find it; and we must not have this very distinct species blotted out without showing why. Now here is my proof towards its continuance. In 1860 or 1861 T. Porter (still living) brought me two fine specimens of a moth I did not know. They were ofboth sexes. I purchased them from him, and sent them on to the Rev. H. Burney, who forwarded them to Henry Doubleday. From him they went to Guenée, and he returned them with the remark that he had a specimen in his collection marked as a variety of *L. testacea*, but he was quite satisfied they represented a good species when he saw both sexes. H. Doubleday then named them after Guenée, as the latter was evidently the original captor. I saw Porter again, and he told me another man, by name H. Stephenson, had one. They took three in all near the ferry at Rhyl, N. Wales. I sent Porter again, and went myself, but we failed to find more afterwards. I bought the specimen from Stephenson, and sent it on to Miss Sulivan, of Fulham, where, I suppose, it remains. I think it was a female. Now could a better tale be told? By the way, how many *L. dumerilii* have ever been taken in this country, and where are they, and who were the captors? I think while there are some of the old collectors and entomologists left these things should be brought to the front. Will anyone who has got *L. dumerilii* publish the fact and particulars of its capture?—J. B. HODGKINSON; 15, Spring Bank, Preston, December 15, 1884.

MYELOIS CERATONIÆ AT GREENWICH.—It may be interesting to some of the readers of the 'Entomologist' to know that I took a fine specimen of *Myelois ceratoniæ* in my house on the morning of December 1st. This is the third specimen I have found in the same room, at different times. The first two were taken in the month of July—one this year (1884), the other in 1880. I believe the insects I have found came from larvæ feeding in almonds. I found some larvæ feeding in almonds some time ago, and, laying them by, I thought no more of them. At any rate, this is the only way I can explain their appearance in such a strange locality. I suppose the late date is not at all remarkable for species bred under the circumstances; the temperature of the house would be sufficient to account for it.—J. Tutt; Beaconsfield Terrace, Greenwich, S.E., December, 1884.

Notes on Coleophoræ.—In October last I found a few cases of a *Coleophora* which agree tolerably well with the description of the case of *C. vibicigerella* which I have had sent me. They are now hybernating, and I hope to give you a good account of them later on. While collecting the cases of *C. artemisiella*, which have been unusually plentiful this autumn on *Artemisia maritima*, I found nine cases of a *Coleophora* which I do not recognize. They are rather paler, but otherwise very similar to the case of *C. paripennella*, an insect one would hardly expect to meet with on a saltern where there are no bushes, and where the plants are occasionally covered with the tide. Whether these are now full grown or merely hybernating to again feed in the spring, time must decide. I hope some of them may reach the perfect state. —Wm. Machin; 29, Carlton Road, Carlton Square, E., December 22, 1884.

Naphthaline.—In reply to inquiries made by me in November, 1883, to Mr. Erastus Corning, of New York City, he very kindly sent me over a box of lump naphthaline, asking that I should give it a fair trial, as he had only found one collector advising the use of it instead of camphor. I had used naphthaline as sold by English chemists for some years past, and at once placed some of it in a separate box of insects, selecting those most prone to grease. After a year's trial I find the insects are entirely free from grease and mites. Mr. Corning told me he had found it useless for destroying insect "pests" already in existence; of this I am unable to speak from personal experience, not having had any to experiment upon. The lump naphthaline has been in great request among my entomological friends. I am pleased with it, and would certainly advocate its use, much preferring it to camphor.—R. M. Sotheby; Eastbourne, December 4, 1884.

[Naphthaline has for some time past come into general use amongst entomologists, for the preservation of dried insects. The lump naphthaline, such as described by Miss Sotheby, *can be obtained at the* shops of those gasfitters who supply the albo-carbon light fittings, or direct from the Albo-Carbon Light Company, Horseferry Road, London, S.W.—Ed,]

Lepidoptera near Bromley.—On page 20 there is rather an unfortunate omission: on line 4 from bottom, after "*Leucania lithargyria*," insert "*Pseudoterpna cytisaria*;" the remark "two—one green and one brown," refers, of course, to the *Pseudoterpna*, and not to the *Leucania*.—T. D. A. Cockerell; January 9, 1885.

OBITUARY.

Sidney Smith, of Walmer, was sufficiently well known as an entomologist to merit an obituary notice. As a scientific collector, an ardent lover of Nature, and indefatigable worker even in his 78th year, few can have exceeded him. A good botanist was he too, whilst his genial happy nature made him a welcome companion. For years he maintained broods of the honeycomb moths, which by his means were broad scattered through the country, and he was one of the first to capture in England *Margarodes unionalis* and *Eugonia autumnaria*. He was particularly lucky in finding varieties of Lepidoptera. No later than in 1884 a trip to St. Margarets yielded him one imago each of *Callimorpha dominula*, with pink and yellow hind wings. Of the latter form he had several, and more than one black one fell to his net. To show his vigour and desire never to be left behind in the sports of his country, it may be mentioned that last summer, although getting very stiff in his limbs, he often joined in a game of lawn tennis. To the hot weather of August may be attributed the illness which ultimately caused his death, for becoming very heated through a walk on the sand-hills, he sat down and took a chill which resulted in pneumonia and bronchitis. He died at Walmer, where he had long resided, on the 28th December last, aged nearly 80 years. Any information which he could impart to other entomologists he was glad to afford, and few London collectors ever left his part of the country without calling upon him. As a conchologist he was not to be despised, and he was known as the discoverer of the true var. *picta* of the common limpet, the form that previously had the credit of being that variety being found to be incorrectly named.

THE ENTOMOLOGIST.

Vol. XVIII.] MARCH, 1885. [No. 262.

MIMICRY IN INSECTS.

By Roland Trimen, F.R.S., &c.

(Concluded from p. 30).

I have given various of the more noteworthy instances of protective resemblance to (first) the prevalent general colour of the surroundings; and (secondly) the colour, form, &c., of particular objects, mineral and vegetable. There remains for brief consideration a third and most interesting group of these resemblances, *viz.*, the cases in which other animals are imitated.

It is to this class of imitations that the term "mimicry" was first applied by Mr. H. W. Bates; and, although the word has the defect of implying in ordinary usage *conscious* or *voluntary* imitation, it has been generally adopted, in default of any better one, to express the actually deceptive likeness of one animal to another, which in all essentials of structure is quite different.

These mimicries necessarily are of a more limited and special kind than those already treated of, seeing that the only animals to imitate which would be of advantage to others are such as can successfully resist their enemies, or are for some other cause exempt from persecution to a large extent, or can serve as prey if approached under cover of a likeness to themselves. If an unarmed creature can wear the aspect of one widely dreaded for its weapons of offence, or a soft and defenceless animal look as if it were encased in the armour of proof borne by some well-protected neighbour, or some toothsome and eatable being bear to deception the likeness of a malodorous, distasteful, uneatable one,—it is plain how useful the disguise would prove. And this is exactly what takes place in Nature,—disguise is resorted to by those who lack the armour, or the weapons, or the uneatableness of the more favoured kinds.

But few cases of actual "mimicry" in this restricted sense have been recorded among the vertebrate animals, Mr. Wallace citing only a few cases where harmless snakes (in Tropical America) copy in a very striking manner certain venomous kinds, and a group of orioles (in the Malayan Archipelago) unmistakably imitate the strong and active honey-suckers of the genus *Tropidorhynchus.* But amongst insects the number of such cases is very large, and the record of them is constantly increasing, as the life-history and habits of the lower animals are more closely observed.

Taking first the case of the mimicking of well-armed by unarmed insects, we find that bees and wasps have excellent imitators in the shape of many moths and two-winged flies, of some beetles, and of a few crickets; and that ants have also beetle mimickers. The transparent-winged moths of the groups represented by the genera *Sesia*, *Ægeria*, &c., and many species of Glaucopidæ, imitate so precisely the aspect of various stinging Hymenoptera that no one but an entomologist could distinguish them as Lepidoptera. One of these Ægeriid moths, *Melittia ursipes*, is not uncommon in Natal; its general aspect and colouring, and densely hairy hind legs, make it exactly like a small bee. Most people must have noticed the drone-flies (*Eristalis*) which haunt flowers, and not only look like bees, but get up a very fair imitation of an angry buzz, and even affect to possess a sting, when you hold them captive, by curving round the hind body. South Africa abounds in beautiful bee-like flies of the *Bombylius* type; and it is probable that, as has been shown in Europe and elsewhere, the disguise of these flies (which are in many cases parasitic as larvæ upon bees) enables them to enter, unsuspected and unharmed, the bees' nests, and there to lay their eggs. The beetles that find their advantage in resembling bees and wasps are chiefly members of the great wood-eating tribe of Longicorns, and in several cases their elytra are so much reduced as to leave nearly all of the folded wing-surface visible, an arrangement which greatly aids in the deception. Mr. Bates has recorded the wonderful resemblance which the crickets of the genus *Scaphura* in South America bear to different large sand-wasps, which are constantly searching for crickets to provision their nests with!

A very remarkable case of the mimicry of a predaceous beetle by a cricket (in the Philippine Islands) is given by Professor Westwood, in which the resemblance is so exact that even that most experienced entomologist was deceived, and placed the cricket among the specimens of the tiger-beetle in question in his collection!

It is among the weevils or "snout-beetles" (Curculionidæ), and the allied Anthribidæ, that the best instances of defensive armour occur, many of these insects having such exceedingly hard integuments that no pin will pierce them. Mr. Bates records two, and Mr. Wallace five, cases in which beetles of the Longicorn group closely copy Curculionidæ inhabiting the same districts; and in one of these Mr. Bates found the hard weevil and the mimicking Long-horn on the same tree.

Turning now to those cases where it is to the interest of defenceless forms which are palatable to their enemies to resemble creatures that are habitually rejected or passed by as uneatable owing to their offensive odour or taste, we find some of the most prominent and perfect mimicries known. The phenomenon is most complete and conspicuous among butterflies; and it is to the distinguished traveller and naturalist, Mr. Henry Walter Bates, F.R.S., that Science owes the first and only rational exposition and explanation of the subject that has been given. His memoir, read to the Linnean Society of London, in 1861, and subsequently published in the 'Transactions' (vol. xxiii.) of that body, was entitled "Contributions to an Insect Fauna of the Amazon Valley. Lepidoptera: Heliconidæ;" and in it he lucidly presented the results of many years' daily experience and observation of the variation, habits, distribution, and relative numbers of the brilliant slow-flying species free from persecution, and of the accompanying imitative forms of different groups. Mr. Bates showed that, while the models were most abundant and presented the ordinary facies of their family, the mimickers were rare, and departed very widely from the appearance of their nearest allies; that the latter frequented the same spots as their models, often flying among them; and that the resemblance in Nature was so exact that his own well-practised sight did not prevent his being constantly deceived by it when out collecting. He observed that the conspicuous and slow-flying Heliconidæ were not pursued by any of the ordinary enemies of insects to which they would have fallen easy prey, and suggested the reason for this security in the peculiar smell which they emitted. Demonstrating the identity in kind of these most striking mimicries with the protective resemblances to vegetable and inorganic forms so widely prevalent in Nature, he traced them all to the operation of "natural selection," the agents being none other than "insectivorous animals," which gradually destroy all the individuals of mimicking species least resembling those which are exempt from persecution.

Mr. Bates gives a list of no fewer than thirty-six cases of mimicry known to occur among the butterflies and moths of Tropical America. In one of these six species (three butterflies belonging to two families, and three moths belonging to two families) imitate one and the same Heliconide species, viz., *Methona psidii;* and in another, four butterflies (of three different families) and a moth all copy *Ithomia flora.* The imitations of species of *Ithomia*, *Mechanitis*, and *Methona*, Heliconide genera, by species of *Leptalis*, a genus of Pierinæ, or "white" butterflies, are so surprisingly perfect that nobody who has seen the insects concerned, or even the figures of them illustrating Mr. Bates's paper, can wonder at their deceiving on the wing the most experienced collector.

The view propounded by Mr. Bates received most weighty confirmation at the hands of Mr. A. R. Wallace, who, in his interesting paper on the Papilionidæ of the Malayan Region (read to the Linnean Society in 1864), called attention to the occurrence of a quite similar series of mimicries in India and the Eastern Archipelago, and unreservedly expressed his entire concurrence in the explanation given of the causes at work in the production of them. Mr. Wallace pointed out that, as in America, so in the Old World, it is butterflies of the Danaid group that are most often the objects of imitation by those of other families, and gave a list of fifteen of the best-marked cases known among the Papilionidæ alone. The first of these may be noted as peculiarly interesting, seeing that the male and female of the mimickers, *Papilio paradoxa*, differ considerably, and that each mimics the corresponding sex of *Euplœa midamus.* In seven of the fifteen cases given only the female is mimetic, and Mr. Wallace suggested that the reason of this is probably that the slower flight of that sex when laden with eggs, and her exposure to attack while ovipositing, render it especially necessary to have a protecting disguise.

It was my good fortune to be able to supplement the cases brought forward by these distinguished explorers of South America and the Malayan Archipelago by a similar series of mimetic analogies among African butterflies. From the beginning of my collecting in South Africa I had been familiar with one or two striking instances of mimicry, and a visit to Natal in 1867 made me acquainted with several others. While in England shortly afterwards I had excellent opportunities of working up the subject, and early in 1868 I read to the Linnean Society a paper (subsequently published in the twenty-sixth volume of its 'Transactions'), describing in detail the eleven cases of mimicry then known to me. It was interesting to be in a position to fortify the conclusions of Messrs. Bates and Wallace by personal observations made in an entirely different region. I showed how the *Danainæ* and *Acræinæ* of Africa, like their allies elsewhere, were provided with offensive odours and secretions, and that several of them were accompanied throughout their geographical range by faithful imitators belonging to quite distinct groups. It was further pointed out (1) that the mimicking butterflies invariably occurred in districts inhabited by the species mimicked, and in six cases (South African) are found in the very same localities; (2) that in eight cases the mimickers are known to be very much scarcer than the species which they copy; (3) that in five cases, where the *Danais* or *Acræa* presents local forms, or merely slight varieties, even these are mimicked by individuals of the imitating species; (4) that in three cases, where the sexes of the insect mimicked differ remarkably from each other, the sexes of the mimicker present corresponding differences; and (5) that, in four cases observed by me in Nature, it was next to impossible to distinguish the living mimicker from the species which it imitated. It must be remembered that these extraordinary likenesses are not those of general colouring and pattern alone, but include outline and form, extending to minute reproduction of prominent markings however small; and that the deception is often further borne out by following closely the kind of flight and mode of resting exhibited by the species copied.

Probably *Amauris echeria*, a Danaide of wide occurrence in wooded localities, is the best-protected butterfly in South Africa, judging from the number of imitators to whom it seems to set the fashion. The most accurate copyist is the female *Papilio cenea* (type), but the female *P. echerioïdes* is almost as good; while the males of these species of *Papilio* are utterly dissimilar both from their respective mates and from each other. Both sexes of *P. brasidas* present individuals which fairly imitate *Echeria;* while among the Nymphalinæ an almost exact reproduction occurs in both sexes of *Euralia mima*, and an approximate one in the female of *Pseudacræa tarquinia.*

As the case of *Papilio cenea* presents perhaps the most remarkable mimetic analogy yet recorded among butterflies, and as it has been worked out in South Africa, and is now widely known and quoted, it may be of interest to offer a few remarks upon it. The male of this species is a very fine conspicuous insect, with a peculiar colouring of very pale creamy yellow, with a broad black border to the fore wings, and a black band across the disk of the hind wings, the latter wings bearing each a long broad process or "tail." It is the southern representative of the West African *Papilio merope*, and was formerly known under that name. Five-and-twenty years ago nobody thought of associating with this beautiful butterfly the altogether different *Papilio cenea*, which is black, with ochre-yellow patches and spots, and has no tails on the hind wings, and, as mentioned above, is so close a mimicker of *Amauris echeria.* Yet these strikingly dissimilar insects, when closely examined, exhibited so many points in common, that finding only males of one pattern and only females of the other, and knowing that the two haunted the same woods, and that the conspicuous *P. merope* had been seen in pursuit of the sombre-tinted *P. cenea*, I was fully persuaded by the year 1867 that the two were sexes of one and the same kind. More than this, I felt next to certain that two other female *Papilios*, *P. trophonius* and *P. hippéoon*, var., one of which mimics *Danais chrysippus* and the other *Amauris dominicanus*, were also females of the same pale yellow tailed male. In the paper dealing with mimetic analogies, which I have already mentioned, I, in 1868, explained at some length the grounds upon which my view of the case was founded; and, although few naturalists were then disposed to accept it, the truth of what was then advanced as in the highest degree probable has since been incontestably demonstrated by the observations of Mr. Mansel Weale, who, in 1873, reared all the four forms from eggs laid on the white iron-wood (*Vepris lanceolata*) by a specimen of *P. cenea*. Mr. Weale's researches and their result have recently been confirmed by Colonel Bowker's notes on the sexes in Natal.

We have thus the remarkable case of a butterfly, in which the male is of a certain conspicuous and unusual coloration, which varies but little, while the female is of three quite different forms, each of which is entirely unlike the male, but imitates one of the three prevalent species of Danainæ inhabiting South Africa! It should be added that numerous intermediate variations of the females exist, which exhibit a series of links between the three prominent forms, and serve to indicate how plastic for further development in any advantageous direction the polymorphic female *P. cenea* remains.

Other circumstances which add to the great interest of the case are (1) that the very closely-allied true *Papilio merope* of Western Africa also has a polymorphic female, several forms of which have been described as distinct species, and are found imitative of Danainæ inhabiting the same region; and (2) that in Madagascar the likewise closely-related *Papilio meriones* has but one form of female, and that form slightly different from the male! What is even more surprising is the fact, communicated to me by Mr. Ch. Oberthür in 1882, that the representative of *Papilio merope* at Lake Tsana, in Abyssinia, also has the sexes almost exactly alike. The inference is obvious that the females in Madagascar and Abyssinia for some reason do not stand in need of the protective disguises so elaborately worked out for them in Southern and Western Africa. Probably some active persecutors of this large pale type of *Papilio* are absent in those countries, or may there have found some easier or more attractive insect prey. In S. Africa the handsome flycatcher, *Tehitrea cristata*, has been seen by Mr. Weale to capture the male *P. cenea*, and he had reason to suspect a bird of an allied family and quite similar habits, *Dicrurus musicus*, to be another of this butterfly's enemies. Insectivorous birds of both these genera are found in Abyssinia—the very same species of *Dicrurus* is, I believe, a native of that country—and also in Madagascar; but it is possible that circumstances may have led to their leaving *Papilio merope* and *P. meriones* unmolested.

We have seen that there are certain cases in which insects escape by simulating the aspect of the very enemies that persecute their tribe, as, for instance, the Scaphuræ of South America imitate the sand-wasps, which provision their nests with crickets; but there is a kindred class of mimicries, not very common, in which the advantage is reversed, the rapacious enemy, like the wolf in sheep's clothing, wearing the appearance of the creatures on which it preys. The Mantis family present some good cases of this description, Mr. Bates recording one occurring on the Amazon River, in which a Mantis exactly resembled the "white ants" (*Termes sp.*) on which it fed. I suspect that a very slender pale Mantis, which I met with in Natal, and which very closely imitated the appearance of certain Phasmidæ, was probably so disguised to enable it to prey more easily on the weak *Bacilli* of the same district. In this Mantis the rapacious fore paws were so formed and held as to hide their real character, and I took it for a *Bacillus* on first seeing it. Hunting spiders are in some cases very like their prey, as may everywhere be noticed in the case of the species of *Salticus*, which catch horseflies on sunny walls and fences. The likeness is not in itself more than a general one of size, form, and colouring; but its effect is greatly aided by the actions of the spider, which walks hurriedly for short distances, stopping abruptly, and rapidly moving its falces, in evident mimicry of the well-known movements characteristic of flies. Many spiders exhibit a strong resemblance to ants, and Mr. Wallace states that those of one tropical genus which feed on ants are exactly like their prey.

Having now rapidly glanced at some of the more prominent instances of the various descriptions of protective resemblance existing in Nature, it only remains for me to repeat my conviction that upon the theory of "natural selection" alone are they at all explicable. If we assume the independent creation of all species of organic beings precisely as we now behold them, it is impossible to understand why there should have been this system of disguises at all. If from the very first the destined prey of other animals possessed in every case the appearance we now find them possessing, would the resemblances we have been considering have protected them in the least? Can it be supposed that certain species of butterflies were created in great abundance, and that certain other species of widely different structure, but superficially imitating the former, were simultaneously created in very small numbers, in order to maintain a precarious existence for ever afterwards? What is the meaning, on this view, of all the gradations in protective resemblance, the incompleteness or imperfection of some mimicries? To these and many other questions that readily occur to us, no satisfactory reply can be made, if it be insisted on that species are immutable, and that the organic world is now in all respects exactly the same as when it sprang into being. But these problems become intelligible when viewed as the natural consequences of the innate variability of species, and the preservation and development by inheritance, through all time and under all changes in surrounding conditions, of every successive variation advantageous to the organism originating it.*

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

By Lyonell Fanshawe.

I.—APPARATUS. COLLECTING IN WINTER.

In offering the following notes upon the capture and preservation of Coleoptera to the readers of the 'Entomologist,' my object is to encourage recruits to the study of this branch of Entomology so much neglected by British insect collectors. The first difficulty found by many who would like to investigate the mysteries of an unknown group of insects, is usually how to commence. The manner of this has to a large extent been already set forth by writers on the subject of Coleoptera, such as Rye, in 'British Beetles,' chapters vi. and vii.; Newman, in 'The Insect Hunter's Companion' (3rd edition); Fowler, in his series of papers in vols. xv. and xvi. of this Magazine; and other authors elsewhere. Though I may be thought to be treading too closely in the footprints of some of the later writers on this portion of the subject, I venture to think that the following hints on the best ways of finding and preserving beetles may be found to be new to some who have not before thought of taking up the subject, or may refresh the flagging interest of others who are wavering between the Coleoptera and their old loves, the Lepidoptera.

---

* Part of an Address delivered at the Annual Meeting of the South African Philosophical Society.

The instruments required for the capture of Coleoptera are both simple and inexpensive. First of all, two nets will be required of the size of an ordinary butterfly-net, one made of strong material for sweeping herbage, and the other of "cheese-cloth," for water-work. Round the top of the net must be sewn a band of linen or holland, into which the ring will slide. If this is not provided the net itself would wear out almost immediately from continual sweeping. The ordinary iron ring bought at any naturalists' shop is the most serviceable, as the work is often rather rough, especially among long grass or weeds, and the more elaborate nets soon get worn out.

Secondly, a "digger" for ripping off the bark of trees, made according to the following plan. Those sold in naturalists' shops are utterly useless. It should be "something in the shape of a mattock, the blade trowel-shaped and slightly curved, and a broad hammer taking the place of the prongs. The blade must he very strong and sharp-edged, and the handle should be prolonged into a sort of crowbar with rather a sharp edge, so as to be able to use it as a chisel and lever united." This is the Rev. J. G. Wood's description; and, though certainly rather heavy, it will be found a most serviceable tool.

Thirdly, a wide-mouthed bottle with close-fitting cork. Bore a hole through the cork, and into this firmly secure a short thick quill, also having a cork in it, and one which can be readily withdrawn with the teeth. By this means the small species can be quickly popped in through the quill, without taking out the larger cork each time. In the bottle, place some well-pounded fresh laurel leaves, covered with a piece of cardboard firmly pressed down and fitting close to the bottle. In the cardboard pierce a number of small holes to let the fumes of the laurel escape into the bottle.

Fourthly, a pair of forceps. These should be made of steel, and with a curve in them, so that they can be pushed into corners where straight forceps could not reach.

These, with the addition of a few pill-boxes, and a small closely-stoppered bottle of spirits of wine, will be everything a collector will find necessary for a successful season.

In the winter months, from January to March, a greater deal more can be done than is generally supposed, more, in fact, than in any other order of insects; and I will try to enumerate most of the best places to find them at this time of the year.

Moss is a never-failing harbour for Coleoptera in the winter, and always yields a large quantity of species, especially those minute ones which are difficult to capture otherwise. When in want of employment, go out into a wood or along a hedgerow, and collect into a large bag, taken for the purpose, all the moss that can be found; when this is filled take it home, and pull it apart thoroughly, piece by piece, over a large sheet of white paper or a sheet. Each piece must be well beaten and torn about, as some of the occupants are exceedingly difficult to dislodge. One of the best store-houses for a coleopterist is a dead or dying tree or log with the bark on, but loose. When out for a stroll always be on the look-out for these, and note their whereabouts in your mind. By far the most productive trees are those having a rough bark; the beetles are very fond of getting up into the cracks and notches on these trees.

Having arrived at a likely-looking tree, let us begin operations. It is a good plan to begin at one end and work steadily along it, tearing off every scrap of bark as you go, and examining both the bark *and* the trunk. If only one be examined, the trunk *or* the bark, many species will be lost. The before-mentioned digger will be found very useful for this work. When all the bark is off, pull back and examine closely the herbage growing by the sides, and finally, if possible, turn the tree over and examine the ground under it. I have found an old decaying willow literally swarming with *Sinodendron cylindricum*, male and female, and all perfectly torpid.

After having broken up and inspected any rotten wood that can be got at, the tree can be fairly left as "done for;" and left it should be, with an ample harvest in the bottle of the energetic collector.

Whenever a stone is met with, of whatever size, it should be lifted up and examined, with the ground under it; many species of Coleoptera are seldom found except in these places. Bricks and tiles, for some reason, hardly ever harbour anything.

The bark on palings and posts, and the crevices about them, should never be passed over.

A ploughed field also frequently contains a great number of beetles. Turn over all the large loose clods of earth round the edges of the field; it is curious that only very seldom is anything found under the clods towards the centre. Hosts of *Staphylinidæ* and others are thus brought to light.

In many counties that contain large rivers, floods are not infrequent, and after a heavy flood has just begun to subside is a great day for the beetle-hunter. By means of the water Coleoptera of every family are flooded from their homes, wherever they may be, and so specimens of each order may be caught. Many species, too, are night-flyers only, and therefore would be almost impossible to capture were it not for this and "light." In the corners of fields by the hedges, and where there is no current of wind, quantities of vegetation, sticks, old leaves, and the like, will collect: these are the places where the spoils chiefly lie. This refuse may either be examined on the spot, or, better still, taken home, like moss, and examined at leisure.

Another very productive locality, and one that appears to be very little known and hunted, is the remains of hay, dust, seeds, &c., which are left after the haystack itself has been removed. This, like everything else in beetle-hunting, must be well and closely examined, and not only turned roughly over and then left.

All animal and garden-refuse, too, contains its own peculiar genera of Coleoptera, which will be found here and nowhere else; and, if the collector desires to have series of these, he must seek them in their rather disagreeable haunts. A good and easy way of obtaining them, is to plunge the refuse into water and stir it about; the beetles will all rise to the surface, and can then be captured without trouble.

An unfailing attraction to all the *Necrophaga* is a dead animal, bird, or fish.

A great prize is a fine rook or hen some time deceased, and beginning to smell unpleasantly strong. They deserve to be overhauled, and to have their locality marked with as great joy as the *Necrophorus* himself. Having discovered one of these tempting baits, lift it carefully up by a leg (or get a friend to do so!), and examine the ground whereon it lay. Then spread a cloth or large sheet of white paper on the ground, tap the bait sharply with a stick, and the collector ought to be amply rewarded for his unsavoury task. Dead animals should be visited, if possible, at night, as many of the *Necrophaga* are night-flyers. I strongly recommend anyone unacquainted with the habits of the Necrophori, not to touch them when alive (but to pick them up with the forceps), as they often emit a most fœtid brown liquid, which smells horribly for days, and even stains the skin. When the dead animal has given up all his tenants, replace it in the same spot, and in a day or two it will be full again. A dead cat or dog by the riverside is very productive, as is decaying sea-weed on the coast. Old bones and skins contain species that are found nowhere else; also sand-pits, salt-marshes, and brackish places.

Every pond, stream, and ditch, will be found to be teeming with our friends. Having arrived at a weedy pond, take out the net made of cheese-cloth and slide it on to the iron ring, screw the ring to a corresponding screw fitted on to the stick, and all is ready. The net should only be dragged about among the weeds and vegetation, not down into the mud below, or the work becomes hopeless. Be very careful of handling the *Gyrinidæ*, or "Whirligig Beetles," as they also, like the Necrophori, emit a milky fluid, which smells disgustingly for a long time.

Flood-water, which has been spoken of before, may be worked in the same manner as ponds, &c.; but it is only necessary here to skim merely the surface, as almost all the beetles will be land-beetles, and therefore float. Do not net the sticks, &c., mentioned above, but simply draw your net through the clear water, which apparently contains nothing, but which in reality contains many a beetle, though they at first escape your notice. The growing herbage, however, may be scraped, as the insects cling to it. A good pair of Dowie and Marshall's water-tight boots will be found of great advantage for this sort of work.

Under heaps of old sticks and faggots lurk many curious beetles. Shake and rap the bundles well, and examine the ground whereon they stood. Also cut osiers stacked for some time will be found to contain many species; but this belongs to summer hunting, of which I purpose to give an account in a future number of this magazine.

I have now, I think, briefly noted the principal localities where Coleoptera may be found in winter, with the exception of light: this is a very great attraction nearly all the year round. Many beetles, as already mentioned, are night-flyers, and can only be secured by this means, or by the flood-waters. The method is the same as that employed for attracting moths, *viz.*: Stand a strong duplex lamp with a reflector behind just inside the window, and another (this without a reflector) further within the room; and then, with the implements of capture and of death ready close by, there is nothing to be done but to await the visits of your guests, whose arrival will begin about dusk and continue until the small hours of the morning.

2, Halkin Street West, Belgrave Square, London, S.W.

(To be continued.)

LEPIDOPTERA IN KENT.

By J. W. Tutt.

I have noticed that some contributors to the 'Entomologist' complain of the dearth of insects at sugar during the past season. My experience—collecting in North Kent and the neighbourhoods of Sandwich and Deal—has been decidedly contrary to this opinion, Noctuæ having been generally abundant; and in the Sandwich district on some evenings not only were they abundant, but other orders of Lepidoptera were frequently represented. One of the most successful night's work was that on August 6th, and the following summary of the night's work will show that not only are Noctuæ fond of the "rum and treacle," but that almost all the other families have some members at any rate that share the same taste.

The species taken at sugar, arranged in their families, were:—

Diurni.—Vanessa urticæ.

Nocturni.—Lithosia lutarella v. pygmæola.

Noctuæ (42).—Bryophila perla, Acronycta rumicis, Leucania impura, L. pallens, Hydrœcia nictitans, Xylophasia lithoxylea, X. sublustris, X. monoglypha (polyodon), Cerigo matura (cytherea), Luperina testacea, Mamestra brassicæ, Apamea leucostigma v. fibrosa, A. didyma (oculea), Miana strigilis, M. literosa, M. bicoloria (furuncula), Caradrina quadripunctata (cubicularis), Agrotis vestigialis (valligera), A. puta, A. suffusa, A. segetum, A. nigricans, A. tritici, A. aquilina, Triphæna ianthina, T. comes (orbona), T. pronuba, Noctua plecta, N. c-nigrum, N. rubi, N. umbrosa, N. xanthographa, Orthosia upsilon, Calymnia trapezina, Phlogophora meticulosa, Hadena trifolii (chenopodii), H. oleracea, Gonoptera libatrix, Amphipyra pyramidéa, A. tragopogonis, Mania typica, Rivula sericealis; also one other species, about which I am still uncertain.

GEOMETRÆ (11).—Epione apiciaria, Boarmia gemmaria (rhomboidaria), Acidalia emutaria, A. imitaria, Aspilates ochrearia (citraria), Eupithecia subfulvata, Melanippe fluctuata, Eubolia limitata (mensuraria), E. virgata (lineolata), Phibalapteryx vittata (lignata), Coremia ferrugata.

PYRALIDES (3).—Scoparia cratægella, S. pallida, Nemophila noctuella (hybridalis).

PTEROPHORINA.—Pterophorus monodactylus (pterodactylus).

ALUCITIDÆ.—Alucita hexadactyla (polydactyla).

CRAMBIDÆ (4).—Crambus selasellus, C. tristellus, C. geniculeus, Melissoblaptes anellus.

TORTRICES (10).—Tortrix podana, T. heparana, T. costana, Peronea variegana, Teras contaminana, Dictyopteryx holmiana, Sericoris urticana, Sciaphila subjectana, Bactra lanceolana, Hypermecia cruciana.

TINEINA (16).—Swammerdamia oxyacanthella, Depressaria flavella, D. assimilella, D. arenella, D. applana, D. yeatiana, D. pulcherimella, D. badiella, D. discipunctella, Bryotropha desertella, Lita acuminatella, L. marmorea, Teleia vulgella, and three other species not determined.

A friend worked the above locality with me, and we made out the above list because the number of species in the different families (except the Noctuæ) were exceptional; although on almost every evening we "sugared" there were some members of the other families quite regular in appearance, *L. pygmæola*, *E. limitata* (*mensuraria*), *P. vittata* (*lignata*), most of the Tortrices and Tineina named, and *P. monodactyla* being regular visitors. Some of the species, on the other hand, occurred on no other evening, and therefore their appearance may have been due to chance, as I only took one of each species, although I know most of the insects were occurring freely in the locality: such species were *V. urticæ*, *A. ochrearia*, *E. apiciaria*, *M. anellus*, and *S. pallida*. *R. sericealis* and *A. hexadactyla* also occurred once, but as I have taken both previously at sugar I believe they are, to a certain extent, regular attendants at the sweets.

Insect life was exceedingly abundant, and some of the species of Noctuæ swarmed. Some of the local forms of the Noctuæ of the S.E. district are remarkably fine, and differ much from the forms of the same species in other parts of Kent. Among the best species taken at sugar in the district during our stay was *Leucania albipuncta*, two, both taken by my friend, and a specimen of *Nonagria sparganii* flying near a ditch, also taken by my more fortunate companion. My friend, not being well up in Entomology, had set these, and they were packed away with our other captures; and it was not until my arrival home that I discovered what he had taken. Two *Doryphora palustrella* were also taken; a Noctua that I cannot yet determine; a *Eupithecia*, which still puzzles me, closely resembling *E. vulgata* in ground colour, but with longer wings (probably larvæ-fed on mugwort, as I obtained the two specimens from that plant); and a worn specimen of *Anerastia farrella* also occurred. *Lithosia pygmæola* was abundant on the sand-hills; on one evening I collected above sixty in a short time. I did not work for them any other evening, although I picked them up all over the sand-hills when after other species. They were still out the third week of August.

My experience in other parts of Kent has been very similar, the great exception being *Nola albulalis*. This species this season was undoubtedly rare in all stages in its old locality. I could get scarcely a larva, where two years ago I could have taken dozens in a short time had I been so disposed; and although I was several times on the ground when the imago should have been out I netted only three. A friend who was on the ground regularly says that scarcely any could be obtained. The restricted locality of the species, the ease with which the larva can be found, and the systematic way in which the species has been worked since its discovery, has undoubtedly had much to do with this; and unless the species be more leniently treated for the next few years it looks very much like being exterminated in its old haunts.

The marshes on the banks of the Thames gave a fine lot of *Leucania phragmitidis*, with a few of the beautiful red var. *rufescens*. *Leucania straminea* was in fine condition during July. I bred this species from larvæ feeding on the reeds the second week in July, during the time that the imago was on the wing, the pupal state only lasting from nine to twelve days. Other species also occurred freely; and, on the whole, I believe this has been, in North Kent, the best season since I recommenced collecting in 1880, although insects have been fairly abundant the previous years, and no entomological collapse has occurred, as there seems to have been in other parts of the country.

In conclusion I may add that *Acherontia atropos* has occurred freely in the potato-fields of North Kent during the autumn, although but a small percentage of imagines have been bred.

Beaconsfield Terrace, East Greenwich, January 3, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Soaring Habit of Vanessa atalanta.—With regard to Mr. Martin J. Harding's note (Entom. xviii. 51), my impression, gathered from my own observation, is that *V. atalanta* is impelled to a more soaring flight during hot seasons than during cooler summers. The first occasion on which I noticed its soaring flight was about the middle of September, 1876, when, as I was taking a ramble through the fields at Ashmore Park, about three miles from Wolverhampton, I saw it in some plenty skimming over the tops of the oak trees, greatly resembling, in flight, *Apatura iris*. They darted through the air with a rapid motion high above the tops of the trees, and then, darting suddenly down on to the clover flowers in the field below, they rested for a moment, and then took another flight over the tops of the trees. While resting on the flowers was the only chance given for a capture. During August and September of that season it was very hot. Although I have seen *V. atalanta* in some plenty in more recent seasons, I have not observed such a soaring flight as on that occasion.—Thos. Hill; March End, Wednesfield, near Wolverhampton.

Gonepteryx rhamni in Dorsetshire.—I recommend Mr. Mansfield (Entom. xvi. 271; xvii. 271) to read Mr. Mansel Pleydell's 'Flora of Dorset,' and Newman's 'British Butterflies.' The larva possibly feeds on blackthorn as well as on buckthorn. In the forthcoming "Lepidoptera of Dorset" it will be recorded as one of the commonest butterflies.—C. W. Dale; Glanvilles Wootton, Sherborne, Dorset, February, 1885.

Luperina dumerilii.—In reply to Mr. Hodgkinson's enquiry (Entom. xviii. 54), I beg to say that I have a specimen of this moth, which was captured in 1858 in the Isle of Portland, by Mr. William Farren, of Cambridge. In Stainton's 'Manual,' i. 206 (1857), it is said that "one specimen only has occurred, in the Isle of Arran"; and in Newman's 'British Moths,' p. 297 (1869), we read that "two specimens of the moth are said to have been taken in the Isle of Portland, by Mr. Seeley; one of them is in Mr. Bond's collection." This, doubtless, refers to Mr A. F. Sealy, now in South India, who certainly had the two specimens, as I well remember, though I rather doubt whether he was himself the captor. Be this as it may, Mr. Sealy and I, in 1858, joined with two or three others, then at Cambridge, in sending Mr. Farren on a collecting expedition to the New Forest, Portland, and elsewhere, which resulted in the capture of a specimen of *L. dumerilii*, which fell to my lot on the division of the spoil. To the best of my recollection it was the only specimen taken in 1858, and it has ever since been in my possession, but unfortunately is in poor condition.—J. W. Dunning; 12, Old Square, Lincoln's Inn, February, 1885.

Luperina dumerilii.—I notice in last month's 'Entomologist' (Entom. xviii. 54) that Mr. J. B. Hodgkinson asks for confirmation of the capture of *Luperina dumerilii.* I am pleased to be able to give him the information that in September, 1858, in company with Mr. A. F. Sealy, I took two specimens in the South of England; one of these was in Mr. Sealy's collection, the other went to that of Mr. Frederick Bond. The next year I took three more in the same locality; one I gave to my friend Alfred Fryer, which I believe is still in his cabinet; I forget where the other two went to, but I think one went to the Rev. H. Burney. —W. Farren; 14, King's Parade, Cambridge.

Lepidoptera at Light in 1884.—Seeing several letters in your columns on the above subject, I may state that my brother and I took at light last summer, at the under-mentioned address (by simply placing an ordinary lamp on a table next a back window overlooking the garden), seventy-five species of Macro-Lepidoptera, including *Smerinthus populi, Nonagria geminipuncta, Dipterygia scabriuscula* (*pinastri*), *Neuronia popularis, Mamestra sordida* (*anceps*), *Apamea gemina, A. ophiogramma, Caradrina morpheus* (very abundant), *C. alsines, C. taraxaci* (*blanda*), *Agrotis tritici, Hadena trifolii* (*chenopodii*), *Plusia chrysitis, Catocala nupta, Epione apiciaria, Melanippe rivata, Cidaria truncata* (*russata*) var. *comma-notata*, &c.—E. B. Bishop; 3, Primrose Terrace, George Lane, Woodford, Essex, January 24, 1885.

The Urticating Hairs of Lepidoptera.—As this subject seems to have aroused some interest, I may mention that I have experienced the disagreeable symptoms described by Mr. South from handling empty cocoons of *Porthesia similis* (*chrysorrhœa*), which I found on a fence at Beckenham, on September 25th, 1880. Now as these cocoons had probably been empty and exposed to the weather for months, I think this militates strongly against the theory of the effects being caused otherwise than by the mechanical properties of the hairs.—T. D. A. Cockerell; Bedford Park, Chiswick, February, 1885.

On the Variation of Eupithecia nanata.—After Mr. Gregson's remarkable statements (Entom. xviii. 52) with regard to his own farsightedness in discriminating specific differences which other entomologists fail to see, I must say I am surprised at his statement that he has "only seen three varieties of *E. nanata*," and these are all in his own cabinet. There must have been a general overhauling of the "many thousands of bred and captured specimens" for varieties before Mr. Gregson's careful search began, or otherwise the "many thousands" must have come from one particular spot where the insect does not vary. This, however, does not satisfactorily prove that the species does not vary, and I can assert that many varieties are taken with the type, every season, in the neighbourhood of Garelochhead, twenty-five miles N.W. of Glasgow, many of which, were they mixed up with the var. *curzoni*, could not be separated from it, so far as the actual appearance of the insects is concerned. Further than this, a dull heavy coloured variety is found in the same locality, which, I believe, is the var. *obscurata*. Mr. Gregson also makes much of the difference in the shape of the wings, but the Garelochhead *E. nanata* vary much in this respect (especially the duller form mentioned); many closely resembling the var. *callunaria* of *E. satyrata*, from the same locality, in the shape of the fore wings. Looking, therefore, at the wide range of variation in the species, only as far north as Glasgow, and the undoubted change that the species has undergone towards the establishment of permanent variation there, how much more likely that the species, in its isolated northern localities, should develop into an actual permanent variety? The only point that can be taken as a satisfactory feature, in determining *E. curzoni* as a species, is the distinct larva; but Mr. McArthur states that he bred all forms, varying from "the southern form to the dark-banded *curzoni*;" and I should presume from his remarks (Entom. xvii. 277) that he noticed no difference in the larvæ from which he bred all the intermediate and extreme forms. If it can be proved that the larva (so-called) of *E. curzoni* is distinct, and that typical *nanata* cannot be bred from the same peculiar form of larvæ, I think entomologists would accept it as a species with better grace; but until then entomologists have a perfect right to be cautious in admitting *E. curzoni* to specific distinction. For myself, I cannot see so great a difference between the *nanata* type and its var. *curzoni* as between the typical *Noctua glareosa* and its Shetland form, and certainly not more than between the type *Melanippe montanata* and its var. *shetlandica;* yet no one has attempted to raise them to specific distinction. The genus *Eupithecia* appears peculiarly unhappy in this respect. Being rather more obscure than the other genera of Macro-Lepidoptera, it seems that certain collectors try experiments on it, which could not perhaps be carried out on other genera with the same chance of success.—J. Tutt; 45, Beaconsfield Terrace, Greenwich, S.E., February 2, 1885.

Eupithecia curzoni.—The only specimens of the Shetland "pug" I saw at Mr. Capper's I pronounced at once northern forms of *E. satyrata;* there is something, to a trained eye, that cannot well be described. As to its being, as Mr. Gregson says, the narrow-winged "pug," that is out of the question. Some thirty years ago, on the bank at Witherslack, I took what I thought to be a new "pug," a shining light leaden-coloured "pug." I sent them to Doubleday, and he wrote me that they came near to the Norwegian form of *E. satyrata* (then *callunaria*). Since then the species, at the same place, partakes more of the characters we get in the woods at Grange; the larva always on the ox-eye daisy flowers. My Scotch *E. callunaria* have all the characters of the Shetland species, only not so extreme in variation. But consider how different are the Shetland forms of *Noctua glareosa,*—whilst these are black, ours are lilac-coloured.—J. B. Hodgkinson; Preston, July 11, 1885.

Scientific Nomenclature.—Since the publication of my remarks on scientific nomenclature, in the February number of the 'Entomologist' (Entom. xviii. 46), it has been pointed out to me that the form in *-ensis* is employed, as a rule, only for adjectives derived from names of *places*, and that *gregsoniana* is the correct adjectival form in Latin of Mr. Gregson's name. His recent discovery should therefore be named *Eupithecia curzoniana.* Having received a letter from Mr. Gregson to the effect that the statement "anything will do for a name" does not occur anywhere in his recent pamphlet, I should like to say that the quotation in question was taken from a review on the same, which in these words really gave the gist of his arguments.—Herbert Chitty; Balliol College, Oxford, February 13, 1885.

Exchanging or Giving away.—I have read with much interest the views of your correspondents as to exchanging or giving away duplicate specimens. Will you kindly spare me space, as one having experience, for a few words on the subject. One of your correspondents laments the "good old days," and the rarity of generosity now-a-days. Another expresses his contempt for outsiders and beginners. I am at one with him as to the picture-makers. But how about the beginners? Ten years ago, scarcely "the good old days," at the conclusion of a little paper, which the then Editor kindly inserted in your useful periodical, I offered some series of a species which I took plentifully, and which I found afterwards was comparatively local. I was surprised, as was the postman, at the number of postal boxes sent for them. Among the applicants many truly were beginners, and may be some were outsiders; but many also were old and well-known entomologists. I have since renewed the offer annually, and have sent the species to more than 250 applicants. I do not say this in self-glorification, but that I may induce others to follow the example, and take the trouble, for trouble it certainly is, to *give*, not merely exchange, any duplicates they may spare. Let not older entomologists forget the time when they, as beginners, were so grateful for the gift and delighted by the beauty of a *Thyatira derasa*, by the pale loveliness of a *Uropteryx sambucata*, or the brilliancy of *Venilia macularia;* and let them, when able, confer that pleasure on others. And may I add, to take a lower stand-point, "giving away" brings other rewards; for the acquaintance, and sometimes the friendship, of well-known entomologists I feel myself indebted to my offers of even so small an insect as *Polia flavicincta*. "Small kindnesses sometimes meet with great rewards."—(Dr.) H. W. Livett; Wells, Somerset, February 6, 1885.

Exchanging and Collecting Insects.—Allow me to say that I fully concur with Mr. Coverdale in his statement on exchanging. It does indeed seem as if the good old entomological spirit was fast fading into nothing but commercial enterprise, which, to my mind, only tends to make this truly enlightening science uninteresting. I certainly value a specimen of my own catching far before one purchased, or an exchange either; to say nothing of the contempt with which I view that ambitious feeling of who shall make the most complete collection. If working up the insect fauna in different districts were more encouraged, entomology would be taken up in a far healthier spirit than it is at present; and if I were only possessed of the means of some of my more fortunate brother entomologists, I would certainly offer a prize once a year to each Society for the finest local collection of all orders of insects, proved to be the collector's own collecting. I think I should then prove the fact that he would have greater pleasure for his pains, and learn more by closer examination of the hunting-grounds of his neighbourhood than by wandering a hundred miles away in search of a hidden treasure he has already probably passed in his daily walks. London entomologists, especially, have, within easy reach, as fine and varied fields of operation as anyone could possibly wish. To prove my argument, with the editor's permission, I will give, in an early number of the 'Entomologist,' a list of Macro- and Micro-Lepidoptera that I have taken within five miles of the Marble Arch.—H. SHARP; 37, Union Street, Portland Place.

[By all means, if accompanied by notes and localities.—ED.]

"BY MUTUAL CONFIDENCE AND MUTUAL AID."—It often happens that when an entomologist visits a strange place for a short holiday he either does not know at all what insects may be expected, or knowing that certain local species do occur in the neighbourhood, he cannot find the locality; and it is perhaps not until after he has left that he finds that there was a fellow-entomologist living in the district who could have given him the very information he needed. Would it not be possible to publish occasionally in the 'Entomologist' a list of names and addresses of gentlemen who would be willing to render assistance in this way to strangers visiting their district? Of course such a plan is open to the objection that some species would be exterminated if the locality where they occur were generally known. Still each one could use his own judgment as to how much it was wise to disclose in each individual case; and without disclosing any of his "pet localities" he might render very valuable and welcome assistance to occasional visitors. I, for one, should be very pleased to give any information I could to entomologists visiting Bournemouth or neighbourhood.—P. M. Bright; Roccabruna, Branksome Wood Road, Bournemouth.

Local List of Insects.—It is proposed, in connection with the Bournemouth Society of Natural History, to publish a list of the Lepidoptera occurring in the Bournemouth district. If any who have been working here or in the neighbourhood at any time would kindly put themselves into communication with me I should feel extremely obliged. Help is especially required in the Micro-Lepidoptera.—P. Bright; Roccabruna, Branksome Wood Road, Bournemouth.

[We hope in this instance a good model for the proposed list may be followed, such as Mr. Porritt's Yorkshire list. It is with great regret we have recently received more than one local list of insects, which must have cost the compilers much time and trouble, but which are all but useless, being mere lists of names, without the addition of useful notes.—Ed.]

Erratum.—P. 48, for A. Chitty read H. Chitty.

OBITUARY.

Edward Caldwell Rye died February 7th, 1885, in the Stockwell Hospital, after a few days' illness, from a virulent attack of smallpox. His age was about fifty-three. The late Mr. Rye's father was a solicitor in Golden Square, London; and the subject of this notice was also intended for the law, being articled to his parent. Having, however, great distaste for that profession he abandoned it before being admitted a solicitor, and studied in surgery, and the knowledge of anatomy, obtained during these latter studies, became most useful to him in his after investigations into insect structure. When about thirteen years of age Mr. Rye was introduced by William Yarrell to Mr. Janson, who rapidly formed his general taste for Entomology into a systematic study of British Coleoptera. This he followed for many years, first coming before the entomological public as an exhibitor of new Coleoptera at the meetings of the Entomological Society. After Mr. Janson ceased to edit the section

Coleoptera in the 'Entomologist's Annual,' Mr. Rye (in 1863) took it in charge, and continued its editor until the Annual ceased. In 1866 'Rye's British Beetles' appeared, as one of Lovell Reeve's series of Natural-History works. This work is so well-known to coleopterists that comment upon it is unnecessary. Mr. Rye contributed several articles on different orders of insects to the 'Encyclopedia Britannica,' his best probably being on Diptera; and was from its establishment one of the editors of the 'Entomologist's Monthly Magazine.' The subject of our memoir was also editor of the departments of Travel and Entomology of the 'Field' newspaper, and contributed largely to the journal, 'Home and Colonial Mail;' but his greatest work was in connection with the 'Zoological Record,' with which he was first associated as editor of the entomological section, but afterwards (in 1873) became editor-in-chief, which post he retained until his death. This position made him thoroughly conversant with Natural-History bibliography; and his untimely death will in consequence be severely felt among all English speaking Natural-History students. In February, 1874, Mr. Rye was appointed Librarian of the Royal Geographical Society, after which his active attention to Coleoptera waned, and he shortly afterwards disposed of his collection, which was one of the best of his time, to Dr. P. B. Mason, of Burton-on-Trent. He took little interest in exotic Coleoptera, but described about a score species new to Britain, nearly all of which are still recognised as good species; in fact whatever work he took in hand was thorough and trustworthy. Mr. Rye was a very fair artist in entomological subjects, and his clever caricature drawings were well known among his friends. He was fond of athletics, especially walking and rowing, and following the latter pursuit nearly cost his life some four years ago, when he was severely crushed on the River Thames between a steamer and a barge. Mr. Rye married a daughter of Mr. G. R. Waterhouse, then Keeper of the Palæontological Department of the British Museum, who survives him. He leaves four children, the eldest of whom is, we believe, studying electrical engineering with one of the Atlantic Cable Companies. His sister, Miss Rye, is well-known in connection with female emigration to Canada.—J. T. C.

THE ENTOMOLOGIST.

Vol. XVIII.] APRIL, 1885. [No. 263.

ON SOME PROBABLE CAUSES OF A TENDENCY TO MELANIC VARIATION IN LEPIDOPTERA OF HIGH LATITUDES, BY THE RIGHT HONOURABLE LORD WALSINGHAM, M.A.*

This address is a most welcome and instructive addition to that branch of entomological literature which deals with variation in the colour of insects.

Melanic variation as exhibited in Lepidoptera from high northern latitudes is chiefly dealt with, but similar variations of colour in those from high altitudes are adverted to, and topomorphic variations are incidentally mentioned.

Speaking of the Lepidoptera of the Shetland Islands, Lord Walsingham says:—

> "The tendency of this variation has in almost all instances been in the direction of melanism (except in the more southern and western island of Arran), exhibiting a preponderance of darkened scales or a suffusion of the markings, in many cases almost obliterating the paler portions of the wing. Among the species exhibiting this tendency in a greater or less degree may be mentioned *Hepialus velleda*, *H. humuli*, *Noctua festiva*, *N. xanthographa*, *Agrotis cursoria*, *A. porphyrea*, *A. lucernea*, *Dianthœcia conspersa*, *Emmelesia albulata*, *Eupithecia venosata*, *E. nanata*, *Melanippe montanata*, *M. fluctuata*, *Camptogramma bilineata*, &c. This same tendency is observable in the majority of the Lepidoptera, and, I believe, of the Coleoptera of the whole Arctic and sub-Arctic regions when contrasted with their more southern representatives."

---

* Being the Annual Address of the President to the Members of the Yorkshire Naturalists' Union, at Doncaster, March 3, 1885.

A similar melanic tendency in the colour of those from mountainous districts is thus mentioned :—

> "It is worthy of remark that where the atmospheric conditions in any degree approach to those of the more northern regions, as they do on high mountain ranges, at varying elevations according to the degree of latitude, the same tendency to assume a darker or more suffused colouring is very observable.
>
> "Mr. W. A. Forbes remarks,* 'In looking through Dr. Staudinger's catalogue I was much struck by the fact that in nearly every case where a local form (whether a variety or aberration) from the Alps is noticed, it is characterised as being *obscurior* or *multo-obscurior*, or with some of the markings *obsoleta*.' He goes on to notice the number of normally black or dark species in the Alps, e. g., *Erebia*, *Psodos*, and some Pyralides."

The author then states that various theories have been advanced at different times, and by different authors, to account for variation in animals, birds, and insects, and it has been attempted to apply some of these to the phenomena which he proposes to consider :—

> "I. Since Darwin drew attention to this cause, the theory of protective resemblance has been most commonly made use of to account for the varied coloration of insect forms. It has been proved almost to demonstration in many instances, that by more or less gradually developed assimilation to surrounding objects, those varieties best adapted to escape the observation of natural enemies have become perpetuated.
>
> "II. Many instances of varied colouring have been referred to an archaic origin; that is, to the preservation of such varieties by hereditary transmission from an ancestral source.
>
> "III. The influence of quality and quantity of food has been brought forward to account for modifications of normal colouring.
>
> "IV. Retarded or accelerated development depending upon climatic conditions acting upon insects in their larval or pupal stages has also been quoted as a cause for variation.
>
> "V. Insular varieties have been attributed to the effects of long isolation and segregation tending to establish special races.
>
> "VI. Atmospheric electricity has also been called into requisition to account for certain changes.
>
> "VII. Mr. Geo. Lewis has argued† that exposure to more or less direct action of the sun's rays may influence colour by acting mechanically upon

---

* 'Entomologists' Monthly Magazine,' xiv. 16.

† 'Transactions of Entomological Society of London,' 1882, p. 503.

the tissues of the scales, and so produce an actual modification of their structure, enabling them to absorb and reflect to us certain rays.

"VIII. And lastly, the same author suggests—but only to dismiss the idea as '*probably incorrect*'—'That blackness arises from the invigorating energy derived from warmth, as blackness absorbs heat rays; but [he adds] in that case it would not properly be a protective colour, but an incident in another line of evolution.'" *

These theories are then examined, with a view to ascertain how far they can be made to account for that particular tendency to melanism under consideration.

It will be seen from the following quotation that the topomorphic variation of such a lepidopteron as *Gnophos obscuraria* is admitted, irrespective of either altitude or latitude, and also the archaic derivation of one of the forms, in the cases of horeomorphic or polymorphic variations:—

"First, it would I think be open to some doubt whether the dark varieties of the northern or Alpine regions are indebted to their colouring for any appreciable measure of protection. In the north of Scotland, and perhaps in the Shetland Islands, the black peaty soil and some few dark lichens growing on the rocks might serve to conceal an insect approaching them in tint.

"It has been observed that *Gnophos obscuraria* and other insects vary decidedly in colour according to the nature of the soil on which they occur, but if we admit that this cause may have some influence where peaty soil is found, it could not be held to account for the like inclination in the Alpine insects to assume a partial melanism, although it has been called into requisition to explain the melanochroic race of certain Lepidoptera occurring in the manufacturing districts of this country, to which I shall have occasion again to allude.

"The only other manner in which such protection might be supposed to arise would be perhaps owing to the strong contrast which would exist between the extreme whiteness of snow and the darker appearance of large or small patches of herbage in its immediate proximity, rendering the latter more nearly black to the perception, at least of human sight, than they would actually be if separated from the shining snow.

"It may be admitted that this contrast would render a dark object under such circumstances less visible than a lighter one. But the amount of protection afforded by reason of these special conditions would appear inadequate to account for any strong hereditary tendency to strive to obtain it.

---

* *Loc. cit.*, p. 517.

"Coming to the question of archaic derivation the researches and experiments of Weismann* and Edwards† may be admitted to have established a well-supported theory that in cases of seasonal dimorphism and polymorphism, one or other of the varieties produced is probably that which has descended through the longest period from an ancestral form. Both these authors have called attention to the fact that there is less disposition to vary in the female sex, and if the females are truly more conservative than the males, we should be inclined to look to the former sex as most likely to indicate the typical coloration of an archaic race.

"Mr. M'Lachlan‡ pictures the survivors of an Arctic fauna moving northward as increasing temperature succeeded the glacial period, a portion of them settling on the tops of high mountains, stragglers reaching the home of their ancestors, and becoming the progenitors of our present Arctic species; but he fails to suggest that the condition of existence in those two distinct settlements being approximately the same, a natural law producing certain forms in the one place might be equally operative to produce them in the other.

"Admitting the extreme value and interest of these researches, and allowing them their due weight in the collection of evidence upon the general subject, we may remark that their authors in no way profess to account for the primary cause of the melanic tendency, except in so far as they would admit it to be traceable to the external influence of climatic conditions. We may yet ask ourselves, What is the exact method by which the pigments are acted upon, and what advantages, if any, do the insects derive from the change?"

On the subject of insular variations it is remarked:—

"Mr. de Vismes Kane, in his address to the Barnsley Naturalists' Society, § on the Variation of European Lepidoptera, properly pointed out that 'all naturalists are agreed that the strongest developed variations are cut off from intercommunication with the rest of their kind by mountains, vast forests, the sea, or other natural barrier.' But although, as he says, 'isolation begets peculiarity,' I am unable to agree that this is the principal cause of the aberrant coloration of the Shetland insects."

Reasons are then given in favour of the hypothesis that the darkened coloration of the Lepidoptera from high latitudes and altitudes is an advantage to them, inasmuch as they are thus enabled to absorb more heat from the sun's rays, as black is the greatest absorber of heat.

---

* 'Studies in the Theory of Descent,' vol. i., and Appendix; English edition.

† 'Butterflies of North America,' and 'Canadian Entomologist,' vol. vii. pp. 228—240; vol. ix. pp. 1—10, 51—55, 203—206.

‡ 'Journal of Linnean Society' (Zoology), 1878, xiv. p. 105.

§ 'The Naturalist,' November, 1884, p. 82.

This hypothesis is thus set forth:—

"Seeing that radiation and absorption alike involve motion, which may be taken to be the basis of the theory of photoplastic mechanical action, we must not forget a point strongly urged by Prof. Tyndall, namely, the importance to the organic world of the ultra-violet invisible rays of the spectrum *on account of their chemical energy.*[*] It has been shown by the same author 'that the invisible rays of the sun show a preference for black, which diminishes the reflection.' It is, of course, no new discovery that among colours black is the greatest absorber of heat. In Craven's 'Recreations in Shooting,'[†] the following passage occurs:—'Colour is well known to influence the rate by which bodies acquire, reflect, or part with heat, and as white is the colour which most readily and perfectly reflects it, and which most difficultly [*sic*] parts with it, so a body clothed with that colour shall retain heat longest, and therefore be better fitted to exist in the coldest latitudes.' Applying this to the winter plumage of Ptarmigan, he continues, quoting from Daniel (the original passage I have been unable to find):—'If two animals, one of a black colour and the other white, be placed in a higher temperature than that of their own body, the heat will enter the one that is black with the greatest rapidity, and elevate its temperature considerably above that of the other; but when these animals are placed in a situation the temperature of which is considerably lower than their own, the black animal will give out its heat by radiation to every surrounding object colder than itself, and speedily have its temperature reduced, while the white animal will part with its heat at a much slower rate.' Birds and animals living through the winter naturally require to *retain* in their bodies a sufficient amount of heat to enable them to maintain their existence with unreduced vitality against the severities of the climate. Insects, on the contrary, require *rapidly to take advantage* of transient gleams of sunshine during the short summer season, and may be content to sink into a dormant condition so soon as they have secured the reproduction of their species; only to be revived in some instances by a return of exceptionally favourable conditions."

It is then dealt with in a concrete form by the following illustrations:—

"We all know how rapidly the pairing of our Lepidoptera is effected. Edwards gives instances of freshly developed males gathering round a female pupa to await the emergence of the perfect insect, and the method adopted by many collectors of attracting males by the exposure of a newly-emerged female is usually productive of a series of the finest specimens.

---

[*] 'Fragments of Science,' Tyndall, vol. i. p. 32.

[†] 'Recreations in Shooting,' Craven, 1847, p. 101.

"I have myself observed in the case of *Acidalia rubricata*, on a warm evening in August, the extreme rapidity with which the males appear to be developed, and how immediately they hurry to pay their attentions to the scarcer and less active females which cling to the grasses and occasionally rise to meet them in their flight. I can scarcely imagine a colour better suited for rapid absorption of heat, with the exception of black, than the beautiful dark red of fresh specimens of this insect, unless it be perhaps the brilliant green of the under side of *Thecla rubi*. Applying this to the more or less melanic varieties of high latitudes, I think we have a sufficient explanation of the process of selection by which these varieties are established and continued under the influence of a climate essentially unfavourable to the paler forms. Those males whose colour enabled them to absorb the heat most rapidly would naturally be the first to harden their wings and to acquire a degree of vitality sufficient to enable them to commence their flight. If we imagine the emergence of a pale and a dark variety side by side at the same moment, it is more than probable that the paler specimen would remain inactive among the herbage, when his darker companion had already commenced his flight. In unfavourable weather the degree of warmth sufficient to arouse even the darkest varieties might be of very short duration, and if this were so the less favoured males might be wholly deprived of the degree of energy necessary to enable them to find their females. The shorter the continuance of passing gleams of sunshine, the greater would be the influence brought to bear against them; and each separate instance, however unfrequent such instances might be, in which they were thus placed at a disadvantage, would have its effect in diminishing their numbers, promoting the survival of only the fittest forms. If this is so it is sufficiently obvious that the first males on the wing have the best chance of transmitting their colour by an hereditary process to the succeeding generation; and if these males were always or usually the darkest of the brood, their progeny would also be for the most part dark."

To ascertain whether it was a fact that a black or dark insect would absorb more heat than a light-coloured one, the following most interesting and conclusive experiments were made:—

"To set this doubt at rest, I took advantage of the few sunny days during the last fall of snow, with a view to test the comparative rapidity of heat-absorption in some of our common Lepidoptera. On the 23rd of January, at 11.30 a.m., I placed two specimens of *Tanagra chærophyllata*, a black insect from the Yorkshire moorlands, and three of *Acidalia immutata*, a white insect from the Norfolk fens, on a smooth surface of snow exposed to bright sunshine at an angle of about 45°; with them I put a male of *Colias edusa*, a pair of *Satyrus tithonus*, a pair of *Thecla quercus*, and three specimens of *Lithosia stramineola*. A thermometer lying on the grass by the side of the snow stood at 48° Fahr. At noon *Chærophyllata* already showed decided signs of melting the snow, so did *Satyrus* and the female *Thecla;* the black edge of *Colias*, which did not lie very flat upon the surface, had also made a slight impression; the others had made none. At 12.30 the same three continued to increase their impression; the others still made none.

"I then placed a piece of black and a piece of white cloth in the same position. At 1 p.m. the mercury stood at 52°, and the effect produced by the darker insects was still more decided. But although the pale ones remained upon the surface they did not appear to protect the underlying snow from the heat-rays to the same degree as did the white cloth, which remained on a slight eminence as the sun thawed the snow around it. The nearest approach to this protection was evidently accorded by the white *Acidalia immutata*. At 1.30 *Chærophyllata* and the black cloth continued to sink, and the male of *Thecla quercus* was apparently giving off as much heat below it as the female, but not being set with the wings equally flat had not shown the effect so soon. The *Lithosiæ* had by this time also had a very slight effect upon the snow, but not so much as any of the darker insects, and *Chærophyllata* had decidedly won the downward race among them."

The address consists of twenty-eight pages, and is replete with interest and instruction. There are many collateral points adverted to,—among them that in the Lepidoptera, as stated in the fourth quotation, there is less disposition to vary in the female sex. This is quite in accordance with what may be observed in cases where the female retains the normal coloration of a group, and the male departs widely from it—e. g., *Spilosoma mendica*, *Ocneria dispar*, *Gnophria quadra*, and others.

The address of Lord Walsingham is a most valuable addition to philosophical entomological literature. It will incite the young to a higher class of Natural History studies, and is full of information to those older naturalists who have long pursued this delightful branch of Science.

J. JENNER WEIR.

EPPING FOREST DURING 1884.

By W. H. Wright.

The long-wished-for sunny summer has passed, and it remains to be proved whether the prognostications of those seers who prophesied that with the return of warm summers a corresponding influence will be exerted upon Lepidoptera, and put an end for a time to the scarcity of insects of that order, which has generally prevailed in these islands during the last three wet years. There is but little doubt that abundant sunshine is necessary to the well-being of most forms of life, and especially to vegetable growths, and, as a natural consequence, to such forms of life as owe their existence to the vegetable world. It would therefore seem to follow that weather which is favourable to the growth of vegetation should likewise be favourable to the insects feeding upon it. And yet there is some room for doubt, for during 1883 and 1884 the trees were more fully foliated than in 1882, especially such as the oak and beech, but without that corresponding increase in the numbers of arboriferous-feeding larvæ which one might expect. Possibly the mild winters of 1882-3, 1883-4, while favouring the growth of trees, may yet have been unfavourable for the hybernating larvæ and ova of Lepidoptera, so that if that is the case we may infer that cold and frost are necessary to the well-being of Lepidoptera in their various stages during the winter months. Of course the character of the spring months must be taken into serious consideration, as we have abundance of proof that a fitful spring, with alternations of frost and mild weather, is fatal to young larvæ.

We are then led to the conclusion that a regular spring, even with low temperature, is more conducive to the well-being of the young larvæ than a fitful one, and a spring of cold sunshiny weather, such as that of the past year, must be the precursor of returning plenty for insect collectors. Such was my anticipation in the early part of 1884, and such was fairly realized, for larvæ were decidedly more plentiful than I have observed them during the three previous years. In some instances I found, however, to my disappointment, that several species had entirely disappeared their old habitats, among which were *Thecla quercus* and

T. betulæ, from the vicinity of Chingford, and *Sphinx cassinea*, from near Theydon Bois.

My earliest expedition was during the second week in May, when I found many larvæ of *Hybernia leucophearia*, fastening together the leaves of young plane trees. Also others of the same genus, viz., *H. aurantiaria* and *P. defoliaria*, on oak and hornbeam in large numbers. I also noticed that some trees were almost defoliated by that little pest to the larvæ-beater, *Cheimatobia brumata*, and its enemy *Calymnia trapezina*. Towards the end of the month the larvæ of many common species were very frequent, especially on the oak, to which trees I almost confined my attention. More than ordinarily prominent amongst them was *Phigalia pedaria* (*pilosaria*), which in point of numbers was equalled only by *Himera pennaria*. Several *Dicycla oo* and many *Scopelosoma satellitia*, besides those of Tortrices and Tineæ, fell to my tray; while an occasional beat at the whitethorn brought to view *Myselia oxycanthæ*, *Porthesia auriflua*, *Nola cucullatella*, *Diloba cæruleocephala*, more *H. pennaria* and *H. rupicapraria*, and from the honeysuckle larvæ of *Uropteryx sambucaria* in plenty. *Phorodesma pustulata* (*bajularia*) must also have been fairly common, judging from the numbers of imagines which appeared subsequently, but being a high and concealed feeder I did not see it. Throughout the whole extent of the Forest at this time the larva of *Pseudoterpna pruinata* (*cytisaria*) was taken in large numbers on its usual food-plant, *Genista anglica*, which plant was more than ordinarily conspicuous, on account of its luxuriant growth. Also *Chesias rufata* (*obliquaria*) and *C. spartiata* were taken in numbers on that part of the Forest near Wanstead.

In the early part of June, upon penetrating further into the Forest, towards Theydon Bois, I found that species of Lepidopterous larvæ were plentiful, but much the same as those above enumerated, except Tortrices, with many of which I was not acquainted. A fair amount of work at the oaks brought down several *T. quercus*, *Pœcilocampa populi*, *Asphalia diluta*, and *Hylophila bicolorana* (*quercana*), and a perfect plethora of the pretty larva of *Oporabia dilutata*, and on the wild rose an occasional *Anticlea badiata* and *A. nigrofasciaria* (*derivata*), and on the crab-tree flowers *Eupithecia rectangulata*, although this was rather late for the latter species. I heard also that

Acrolepia betulella was taken from the birch somewhere about this time.

As the autumn drew on, such larvæ as are generally found in the Forest were fairly plentiful, and in some cases numerous, notably in that of *Platypteryx binaria* (*hamula*) from oak, it being a common experience during the end of September and beginning of October for collectors to take several dozen on each visit. Also of the same genus, *P. cultraria* (*unguicula*) from the beeches, *P. falcataria* and *P. lacertinaria* (*lacertula*) from birch. Among those which can be classed as numerous were *Dasychira pudibunda*, *Ephyra trilinearia*, *Eurymene dolobraria*, *Boarmia abietaria*, *H. prasinana*, *H. bicolorana* (*quercana*), *Lophopteryx camelina;* and, in a lesser degree, *Numeria pulveraria*, *Iodis lactearia*, *Demas coryli*, *Hemithea strigata* (*thymiaria*), and many others.

It will thus be seen that, as far as the larvæ of common species are concerned, a brighter future may be looked for, and if the past year has been propitious to the growth of common species, we may look forward to a like effect upon the rarer.

As regards the perfect state of Lepidoptera, my experience of the Forest was not so bright; this was probably due to the effects of the previous year, although as regards such species as usually appear at the end of spring I did not notice any great falling off; in fact several species were unusually abundant, to instance which I may mention *Argynnis euphrosyne*, *Nisoniades tages*, *Syricthus alveolus*, *Melanthia bicolorata* (*rubiginata*), *Cidaria fulvata*, *Melanippe sociata* (*subtristata*), *Angerona prunaria*, *N. pulveraria*, *Procris statices*, *Noctua festiva*, *Euclidia mi*, *Aplecta nebulosa*, and later on *Charæas graminis*. In lesser numbers, *A. selene*, *Lycæna argiolus*, *Odontopera bidentata* and *P. pustulata* (*bajularia*), and as the season advanced *Pericallia syringaria*, *Plusia iota*, and several fairly good species. *Emmelesia decolorata* and *Stauropus fagi* also fell to my lot during the season; and although I was prevented by circumstances from collecting as much as I should wish, yet I found species certainly more abundant than in the two preceding seasons, and I confidently look forward to a much better one during this coming year; and if there is anything in the theory of increased sunshine, we may look forward to filling some of the blanks in our cabinets.

Secretary's Department, Inland Revenue,
Somerset House, London.

ORIENTAL ENTOMOLOGY.

By the Rev. F. A. Walker, D.D.

(Concluded from p. 41).

Neuroptera, understanding by this term all species belonging to the tribe, according to the Linnean application, are only scantily represented as a rule, so far as my own observation goes, in the regions of the East. For example, in my tour of 1882, I only came across four species of dragonflies, and three of these were common English ones, two of them, viz., *Libellula depressa* and *Calepteryx virgo*, skimming around the luxuriant vegetation on the banks of the River Meles (a short distance above the grotto of its nymph, and where she is reported, according to popular tradition, to have nursed the poet Homer) on May 8th. The same two species were also noticed at a later date, namely May 25th, about the wooded and stream-fed lawns adjoining the great bend or reservoir of Sultan Selim in the vicinity of the village and forest of Belgrade; while the third and commonest kind was *Sympetrum striolatum*, likewise seen at Belgrade, and so plentiful at home, more especially on heath or common in the autumn. The fourth one, also occurring at Belgrade, was *Crocothemis erythræa*, of the same shape and size as *L. striolata*, but clearly to be distinguished by its bright red body from the tawny colour of the latter. During my second expedition I have also only the occurrence of four species to report in the months of November and December, 1883, as follows:—*Libellula striolata*, *Trithemis rubrinervis*, and *Crocothemis erythræa*, and all at Villa Ciccolani public gardens, Cairo, Island of Roda, and Matareeyeh Gardens, Heliopolis.

Trithemis rubrinervis is not so common as the two other species, and, though nearly of the same size and form, has its body, if anything, more tapering in shape, is a singularly handsome kind, crimson or magenta coloured, with a blue-purple stripe down each side. I first saw it on the Island of Roda, and afterwards in the gardens of the Villa Ciccolani, as good localities as any I know of in Egypt for the capture of Neuroptera. The fourth, I regret to say, I was unable to obtain, and am therefore ignorant of its name. It usually flew very rapidly and high overhead backwards and forwards, while I was forcing my way through the tall flags and thick underwood which fringes a portion of the island of Roda for the chance of a cast of the net. The colour of the body was lavender-blue, like that of the male of *L. depressa*, but in size it exceeded *Æschna grandis* or *Anax imperator*, and was the largest species of any *Neuroptera* that I have ever seen alive.

My visit to Athens and its neighbourhood in the latter end of May and beginning of June, 1882, must also be mentioned, as I then captured two species of Neuroptera, differing from dragonflies, being either the perfect insects of the ant-lion, or else allied to these last. The smaller and by far the commoner of the two had brown-spotted and gauzy fore wings, and the hinder wings much elongated and very slender, in the shape of tails. It abounded everywhere, in the pass of Daphne, the Stadium, Mount Lycabettus, &c., and was especially plentiful on the hill of the Acropolis, in the immediate vicinity of the Parthenon, where the grass was alive with its numbers. Its name is *Nemoptera coa*. I find the nomenclature of the Neuroptera in the National Collection very defective and unsatisfactory for anyone, like myself, wishing to compare and name specimens. *Palpares libelluloides* is a rarer and much larger insect. I captured it in the pass of Daphne, and on the hill-side near the Throne of Xerxes. Its name, *libelluloides*, is, of course, to be attributed to the fact that in the wide spread of its wings and brown spots upon them it resembles some of the Libellulidæ, *Libellula quadrimaculata* in particular.

I obtained a single specimen of a third kind, *viz.*, *Myrmeleon sævus*, in the vicinity of Belgrade. This last bears a superficial resemblance to the genus *Agrion.* All these perfect insects of the ant-lion, or those akin to them, have a slow, feeble, and wavering flight.

The rare occurrence of brooks and streams, and likewise the fact that so few of the winter torrents are perennial in their flow, may possibly serve to account, to some extent, for the paucity of species of Neuroptera so noticeable in the East.

Among Hymenoptera may be mentioned a well-known continental species, *Xylocopa violacea*, from the Pass of Daphne, in May, 1882, and two kinds of hornets; the one, our own *Vespa crabro* from the tombs of the Maccabees, in March, and also occurring at Ephesus, Philadelphia, and the River Meles, in the month of May, 1882; the other is *Vespa orientalis*, resembling our English one in colour and markings, but more elegant in shape. This last one was swarming in December, 1883, in and about Cairo and Heliopolis, being more particularly abundant on the high mud-built walls in the vicinity of the Boulak Museum and the Ostrich Farm; and likewise found at Helwan, Lycopolis, and on the roof of the Temple of Isis at Denderah, in which last place it was seemingly engaged in attacking the clay-built cells of another species of hymenopterous insect, a small rust-coloured bee, *Chalicodoma sicula*, of which there are specimens from Sicily and Algiers in the National Collection. *Chrysis nobilis* is a small bee with blue metallic body, very much like a bluebottle in size and general appearance, frequenting the flowering shrubs in the public gardens at Cairo, in those of the palace of Gezeedeh, and the mimosas bordering the fields in the neighbourhood of Minieh. On referring to my cabinet I find that one specimen is named *Stilbum amethystinum*, and it is possible that, on closer examination, I may discover that I have both kinds, as this last named and *Chrysis nobilis* are nearly allied species, and of similar appearance.

Among the wasps may be noticed two black-bodied species, *Eumenes hottentotta*, from Cairo, and the larger *E. tinctor* from a field to the south of Minieh; both caught in the month of December, 1883. I have a third species (probably a *Eumenes* also) from the banks of the Pharpar, in April, 1882, whence I also obtained a species of *Mutilla*, or winged ant (thorax rust-coloured, body black, with pale yellow spots). Lastly, I have a small portion of a tree-wasp's nest that I found on a shrub alongside the high-road between Mersina and Tarsus, on the 29th of April. Judging from the size of the cells it can only have been constructed by a small species.

Of Diptera I secured five species: two from the neighbourhood of Athens,—one *Dasypogon punctatus* on the hill of Colonos, on June 9th, and the other, another kind of *Dasypogon*, from the Stadium, at the end of May; the third and fourth are respectively a species of *Tabanus*, or horse-fly, from the plain of the Litany, in April, and *Laphria atra*, Ephesus, in May; the fifth, likewise from Ephesus, is as yet unnamed.

Of Hemiptera I collected eight species, of which the five that I succeeded in naming, and two of the unnamed also, are all red, or reddish, with black patterns on their wing-cases:—1, *Lygæus militaris* widely distributed, as collected at Aceldama and the Valley of Jehoshaphat, Mount Pagus, the Pnyx, the Acropolis, and Deceleia; 2, *Strachia picta*, from the Stadium and Throne of Xerxes; 3, *Pyrrhocoris ægyptius*, from flowers close to Sardis railway-station, and also from Mount Pagus; 4, *Odontoscelis fuliginosis*, also from Sardis; 5, a species of *Rhaphigaster* from Ephesus; 6 and 7 were collected on the summit of Boulgourloo; and 8 is one of the *Hydrometridæ* from Beyrout.

Homoptera are solely represented by one kind, *Triecphora sanguinolenta* from Aceldama, in April; Ephesus, in May.

ON THE GENUS *AGROTIS*.

By J. Tutt.

Can any of our older entomologists give me any decided information pointing to the conclusion that *Agrotis tritici*, *A. aquilina*, and *A. obelisca* are only forms of one and the same species? I remember some time ago reading an article on the subject, but forget on what facts the conclusion arrived at (if any) were based, and I cannot now find the article referred to. I believe some of our leading entomologists treat *A. aquilina* as a variety, but consider *A. obelisca* as specifically distinct. My own experience would point to the conclusion of all three being the same species. I took, during the first fortnight of August, in the neighbourhood of Deal, some 400 *Agrotis tritici*, of every possible form. Certainly I took fifty distinct forms, from a pure pale gray, with faint reticulations and the ordinary discoidal spots of the same colour, to very dark specimens, some of which are beautifully tinged with red, the others being of every intermediate shade. Among these were five or six specimens of the ordinary pale brown form known as *A. aquilina*, and four other undoubted southern *A. obelisca*. Fortunately, I have been able to compare the latter with Scotch specimens which have been sent to me by Mr. Buglass, of Ayton, Berwickshire, and I have no doubt they are really *obelisca*. Of course the fact of taking the species together proves nothing, but I believe I have every gradation of form leading up from the typical *A. tritici* on the one hand, to *A. aquilina* and *A. obelisca* on the other, and this, I think, points to the conclusion of a common origin of these species, *aquilina* and *obelisca* being two divergent forms of *Agrotis tritici.* I believe, in some northern localities, *A. obelisca* is taken without *A. tritici,* but this might be only a case of the adaptation of this particular form to a certain district, as is the case with the different forms of *Gnopha obscuraria* and *Boarmia repandata.* In the south, I believe every locality that produces *A. obelisca* or *A. aquilina* also produces *A. tritici,* while a few places, of which Deal is one, produces all three forms. The insect taken in Ireland under the name of *aquilina* is much less distinct than many of our own well-marked forms, and would I think at once be referred by entomologists who know *A. tritici* in the South of England rather to that species than to *A. aquilina.* I have been unable to get Irish *A. obelisca,* but understand from a valued correspondent on the west coast, that, although he believes *A. obelisca* occurs there, he is unable to distinguish them; and although I have received a large number of good forms of *A. tritici,* I have never got one at all approaching *A. obelisca.* These three so-called species seem to be rather mixed up; but until some very strong proof is urged in favour of their being distinct, I shall look upon them simply as forms of one and the same species, of which *A. tritici* is the type, and *A. aquilina* and *A. obelisca* divergent forms.

Before concluding this note, I should like to add that I took some very extreme and beautiful forms of *A. cursoria,* some of them closely resembling the Shetland forms. *A. valligera* (which occurred abundantly) also varied very much, two or three specimens being pale and almost devoid of markings, while a few were intensely dark. *A. puta, A. suffusa,* and *A. nigricans* swarmed. The latter is a very distinct though variable species, and it seems rather out of place in our lists, between the closely allied *A. cursoria* and *A. tritici,* which in the pale forms seem to hug one another very closely. I was also fortunate in securing a fine male specimen of *A. lunigera,* which I believe is new to the Deal district.

Another important fact I think worth record is, that out of some hundreds of specimens of this genus captured there seemed to be an almost total absence of forms of a brown colour; pale grey forms and very dark (almost black) forms occurred frequently, with intermediate shades of grey marked with black, but scarcely a specimen of a warm brownish colour. The insects show remarkably against Irish specimens from the west coast, where brown is the prevailing colour in the genus. To those who take these species in the South of England, Irish specimens are a splendid addition, and afford room for good and valuable study.

I think if some of our older and more experienced entomologists would give us information from the great stock of knowledge they possess, many of the difficulties by which comparative beginners are beset might be cleared up. If any gentlemen can give positive information on the correctness or incorrectness of my conclusion, I think many entomologists who are really working for scientific purposes, and to whom the mere collecting is not everything, would, like myself, thank them most heartily.

Yet another query respecting the genus. Can anyone tell me whether *Agrotis pyrophila* occurs now in Great Britain? If so, in what counties or county? And does it occur regularly or periodically? Information will be thankfully received on my part.

Beaconsfield Terrace, E. Greenwich, S.E., Feb. 28th, 1885.

LARVÆ OF BRITISH PTEROPHORI.

By Richard South.

May I again venture to ask the assistance of entomologists to enable me to continue the life-histories of our plume-moths? I append a list of the species I still require, and shall be very thankful for one or two larvæ of either of the species. If desired, I will gladly return to the sender any insects bred from larvæ sent for figuring and description.

Cnæmidophorus rhododactylus.—Larva, end of May and beginning of June on dog-rose. Feeds on the buds, concealing itself by drawing a leaf to the bud by silken threads. While in North Devon I received two larvæ of this species from Mr. Carrington. One of them was in a moribund condition, but the other appeared healthy, and I took down a full description, from which I make the following extract:—Ground colour yellowish green, dorsal line reddish-violet, narrow on the 11th, 12th, and 13th segments, but swelling out into a stripe on the 2nd to 6th segments inclusive. The larva failed to pupate, and I am still wanting figure and description of the pupa. Strange to say, *C. rhododactylus* seems to have disappeared from its well-known locality in Kent, and I have not been able to meet with it in a less-known locality in Middlesex since 1878. As I remarked in a former paper this insect will probably be found in other places where dog-rose abounds. It is more likely to be met with in the larval stage, by those who will seek it at the time and in the situation referred to above. The imago is rather sluggish, and does not often fly in the daytime. It has been taken at light.

Platyptilia bertrami, Rössl.—Larva, end of May and beginning of June, on yarrow (*Achillea*), eating young shoots, and slightly excavating the young stems. I took about a dozen imagines of this species at Mill Hill last July, on a railway-bank, and shall endeavour to find the larva there this year.

P. isodactylus.—According to Mr. C. G. Barrett this species is double-brooded. Larva, May and August, mining shoots of a marsh species of ragwort (*Senecio aquaticus*). As Mr. Barrett's very lucid and complete account of the habits of this larva is accompanied by a description of the larva itself from the pen of the late Mr. Buckler, my wish to re-describe it may appear superfluous, not to say egotistical. I may say in justification that in this instance, as in all others where a plume larva has already been described, I am only induced to re-describe that the descriptions may be formed on a fairly uniform plan, and in this way facilitate comparison. The addition of figures illustrating mode of feeding appeal to the eye, and, in conjunction with notes on the same subject, enable the "larva-hunter" to engage in his work with some prospect of success.

Amblyptilia acanthodactyla.—Larva, in July, on rest-harrow (*Ononis*), hedge-woundwort (*Stachys sylvatica*), wild basil (*Calamintha clinopodium*), a species of wild mint (*Mentha*), &c.; also in gardens, on geranium and pelargonium. At Ventnor, on August 30th, 1883, I found a number of larvæ feeding on the flowers and unripe seeds of *Stachys sylvatica.* I have descriptions of larva and pupa, but no figures.

A. cosmodactyla (=*punctidactylus*).—Larva, in June and July, on seeds of columbine (*Aquilegia vulgaris*) and meadow crane's-bill (*Geranium pratense*).

Oxyptilus distans.—I do not know anything of the larva of this insect; but Mr. Stainton's note (E. M. M. v. 36) on the economy of a closely-allied species, *O. lætus*, Zell., offers a clue for those who have the opportunity to follow it up.

O. pilosellæ and *O. hieracii.*—Larva, in June, on *Hieracium*. Examine the under sides of the leaves.

O. parvidactylus.—Larva, in May, said to feed on thyme and *Hieracium*.

Mimæseoptilus bipunctidactyla.—I am inclined to think that *M. bipunctidactyla* and *plagiodactylus* are only forms of one species. I have a long series of both varieties from various parts of England. Looking at the series of both as a whole, variation as regards intensity of wing-marking and size of individuals is exhibited; but the range of variation, as regards markings and colour, is not so striking as in my series of *P. gonodactylus*, also from various English localities. *M. plagiodactylus* I have bred from larvæ feeding on, and partly in, the shoots of *Scabiosa*. These were sent me by Mr. Purdy, of Folkestone. Previous to this Mr. Gregson had been good enough to send me larvæ of *plagiodactylus*, or as he named it, "*scabiodactylus*." In his note accompanying the larvæ, Mr. Gregson wrote, "You will see how distinct it is from *plagiodactylus* of our list, which has a larva having a broad claret dorsal line." The body-colour and ornamentation of Mr. Gregson's larvæ may be briefly described thus:—Whitish green; dorsal stripe reddish-pink (or rose-madder), most distinct on the 9th to 12th segments. Comparing the Folkestone larvæ with the full description taken from those sent me by Mr. Gregson, I found that they agreed in every particular. I admit that the perfect insects bred from Mr. Gregson's larvæ are more strongly marked, and perhaps smaller, than imagines from the Folkestone larvæ; but as the forms are so identical in their early stages I could not agree with Mr. Gregson as to the distinctness of his insect. I may add that I possibly owe it to Mr. Gregson's well-known courtesy that he refrained from referring to this as an additional proof of my inaccurate knowledge of British plume-moths in his somewhat ambiguously worded, but otherwise characteristic article, anent *scientific* nomenclature, in a recent number of a Natural-History journal

The following rough description refers to a plume larva I obtained at Brandon, July 3rd, 1882, by sweeping the flower-heads of such plants as *Scabiosa*, *Centaurea*, *Silene*, *Echium*, &c.:—Length 4 lines, tapering slightly posteriorly. Head yellowish, spotted with black; mandibles black. Ground colour dingy green, with a broad purple-madder dorsal stripe edged with yellowish, rather narrower on 2nd to 4th segments inclusive; 2nd segment yellowish, with six black dots. Prolegs and anal claspers black.

The above portrait was drawn in the field. The larva was placed in a small tin box, with flower-heads of the various plants named above; but owing to a pressure of work I failed to look into the box again until July 24th, when I found a fine but defunct *plagiodactylus*. I should state that I was not ostensibly sweeping for larvæ when I "fluked" the plume larva referred to; I was, in fact, stalking a wary specimen of *Agrophila trabealis*, Scop. (= *sulphuralis*, L.), at the time. The moth was observed to settle among a patch of *Echium;* but when I arrived on the spot I could not see *trabealis*, so I gently passed the net to and fro over the heads of the surrounding herbage, with the result of capturing the fugitive moth, and the larva of *plagiodactylus* also.

M. zophodactylus, Dup. (= *loewii*, Zell.)—Larva, in August and early September; flowers of common centaury (*Erythræa centaurium*). I have a description of the larva, taken from a solitary example in 1881. Ground colour yellowish green, with a broadish violet dorsal stripe from the 3rd to 13th segments inclusive.

Pterophorus monodactylus, L. (= *pterodactyla*, Hb., Haw.)—Larva, in August; flowers of convolvulus, both wild and garden.

Leioptilus osteodactylus.—Larva, in September and October; flowers and seeds of golden-rod (*Solidago virgaurea*), yarrow (*Achillea millefolium*), and mugwort (*Artemisia vulgaris*). Hibernates and pupates in the spring.

Aciptilia tetradactyla.—Larva, said to occur in May and June, on thyme. I have expended many hours in vain searching for the larva of this species.

12, Abbey Gardens, St. John's Wood, London, N.W.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. V.—OPHIONIDÆ (*continued*),

Charops, *Holmgr.*

Middle of abdomen red; front legs reddish, base black.
1. *decipiens*, 5 lines.

This species is much like *Campoplex pugillator*, but with no areolet in the front wings. It appears to be rare. According to Giraud it is parasitic on *Zygæna filipendulæ*, and has been bred by Perris from *Botys lupulinalis*.

Since the publication of the generic table of the Ophionidæ, another of Förster's genera has been detected in this country. This will necessitate a slight alteration. In Section II., Division I., Subdivision 1, after *B.* must be added:—

† Eyes hairy.
! Wings without an areolet; post-petiole with a transverse depression. *Thymaris.*
!! Wings with an areolet. - - - - - *Cymodusa.*

Thymaris, *Först.*

2nd and 3rd segments of abdomen red-banded, 4th obscurely so; front legs pale red, base black, hind legs black, middle of tibiæ red.
fasciatus, 3½ lines.

This very distinct subdivision of *Cymodusa* has been added on the strength of a male specimen captured in Norfolk by Mr. Thouless, in 1884. Förster, as was so often his custom, described no species of the genus he created. Brischke described *T. pulchricornis* in the Danzig. 'Schriften' (vol. v., pt. 1, p. 38), but that is very distinct from the one now under consideration.

Cymodusa, *Holmgr.*

A. Abdomen black (male).
Front legs and apex of hind trochanters yellow, middle of hind tibiæ yellowish red. - - - - - - *flavipes*, 3 lines.
B. Middle of abdomen more or less red; legs red, coxæ and base of trochanters black, tarsi fuscous; aculeus about as long as the 1st segment (males and females).

a. Antennæ of female white-marked towards the base; supero-medial area of metathorax wider than long. - 1. *leucocera,* 3 lines.
b. Antennæ not white-marked; supero-medial area not shorter than wide. - - - - - - - - 2. *cruentata,* 3 lines.

The species of this genus, so like *Limneria*, are easily distinguished by the eyes being rather densely clothed with short stiff pubescence. *C. flavipes*, Brischke, is added to the British list at Trans. Ent. Soc. Lond., 1882, p. 149. *C. cruentata* has been bred by Mr. Bignell from *Anisopteryx æscularia.* Brischke bred his *C. elachistæ* from an *Elachista,* which mined the leaves of *Phleum pratense.*

SAGARITIS, *Holmgr.*

A. Abdomen black (males and females).
a. Post-petiole with three pits; 2nd abdominal segment transversely impressed.
Femora, tibiæ and tarsi greater part red: aculeus half the length of 1st segment. - - - - - - - *incisa,* 2½ lines.
b. Post-petiole with no pits.
* Hind tibiæ black- or fuscous-marked.
Hind legs greater part black; middle of tibiæ and base of tarsi whitish; aculeus longer than 1st segment. *laticollis,* 2—2½ lines.
** Hind tibiæ entirely red and yellow.
Black; legs red, coxæ and base of trochanters black, middle of hind tibiæ yellow; aculeus as long as 1st segment. *postica,* 3½ lines.
B. Abdomen more or less red (males and females).
a. Intermediate segments generally more or less red-margined; sides sometimes red; abdomen sometimes almost or quite black.
* Middle and hind femora black; aculeus long.
1. *declinator,* 3—4 lines.
** Femora red, base and apex of hind one sometimes almost entirely dark.
† Recurrent nervure received before the middle of the areolet; aculeus as long as petiole of abdomen. - 2. *zonata,* 2—3½ lines.
†† Recurrent nervure received in or behind the middle of the areolet; aculeus longer than petiole of abdomen. 2. *latrator,* 2—3½ lines.
b. Middle of abdomen and legs red; coxæ and base of hind trochanters black, hind tarsi piceous; aculeus shorter than the 1st segment.
raptor, 3½ lines.

This genus is easily distinguished by the horn- or tooth-like termination of the clypeus. Holmgren describes seven species in his 'Monographia'; Tschek includes ten and *S. ebeninus*, Gr., in his 'Die Österreichischen Sagaritis-arten' (Verh. z.-b. Gesell. Wien, xxi., pp. 45–53). We are convinced there are several species mixed up in *S. zonata* and *S. latrator.* Gravenhorst says the aculeus of *latrator* (which he describes as one-fourth the length of the abdomen) is longer than *zonata* (which he describes as one-fifth the length of the abdomen); but he adds a variety of *zonata*, of which he says, "aculeus longitudine quartæ aut quintæ partis abdominis," which thus connects the two; the coloration of the abdomen and legs also varies greatly. None of our specimens quadrate exactly with any of Tschek's four species, so we follow Holmgren, and keep them together until more bred specimens come into our possession; even the neuration and areæ of metathorax, which Tschek uses for his distinguishing characters, do not appear to be constant. We have included Tschek's distinctions between the two species, but do not consider them satisfactory. The cocoons appear to offer a much more appreciable character than the imagos. We know four distinct forms of *S. zonata*:—(1) Cylindrical (3½ by 1¼ lines), hard, pearly white, semitransparent, without markings, except a narrow opaque white central band, surrounded by a few slight silky white hairs, ex *Cheimatobia brumata.* (2) Pale yellowish white, subopaque, without markings; bred by Mr. Bignell, ex *Hecatera serena* (? *latrator*), figured on plate ii., fig. 2. (3) Opaque white, with faint black zonal markings; bred by Mr. W. H. B. Fletcher, but host uncertain (? *maculipes*). (4) Deep brown, rather rough, without markings, ex *Eubolia cervinaria* (? *zonata*, male); resembles the cocoon of *S. incisa*, but is rather narrower and paler. The cocoon of *S. declinator* is cylindrical (3¼ by 1¾ lines), brown, without markings. That of *S. laticollis* rather smaller (3 by 1⅛ lines), brown, reticulated with black; this stronger towards base and apex, surrounded by brown flossy silk, ex not half-grown larva of *M. typica* found feeding on fuchsia by Mr. P. Inchbald, in the People's Park, Hull. The cylindrical (3 by 1¼ lines), wrinkled, leathery, unicolorous olive-brown cocoon of *S. incisa* is figured on plate ii., fig. 12. Brischke describes the cocoon of *S. raptor* as cylindrical, hard, dirty white, with two zones consisting of black spots, and the poles strewn over with such spots and dots, ex *Orgyia antiqua;* of *S. cognata*, Tschek. ?, he says, "cocoon cylindrical, unicolorous pale brown, from a young Noctua larva." To the two species in Marshall's catalogue we can add *S. raptor*, Zett., *S. incisa*, Bridgm. (Trans. Ent. Soc. Lond., 1883, p. 165), also *S. laticollis*, Holmgr. (in Mr. Marshall's collection from Bishop's Teignton and Abergavenny), and *S. postica*, Bridgm., a new species.

The following species have been bred:—

1. declinator, *Gr.*, from uncertain host. Bignell, 25th March.
zonata group, from Cheimatobia brumata; Bignell. Eubolia cervinaria; Cross. Hecatera serena; Bignell. Coleophora therinella; Fletcher.
raptor, *Zett.*, from Orgyia antiqua, Eupithecia campanulata, E. sobrinata; Brischke.
laticollis, *Holmgr.*, from Mania typica; Bignell.
incisa, *Bridgm.*, from Anisopteryx æscularia; Norgate.
Kriechbaumer bred a species from Grammodes Algira.*

CASINARIA, *Holmgr.*

A. Apex of abdomen not compressed at the sides (males and females). Abdomen black.
a. Scape of antennæ pale beneath.
Orbits yellowish white; legs red, coxæ and trochanters black, hind tibiæ and tarsi white and black variegated.
1. *orbitalis*, 2½—3 lines.
b. Scape of antennæ entirely black.
Legs red, coxæ and trochanters blackish, front ones sometimes entirely or apex yellowish, tarsi and hind tibiæ black, the latter in the middle, outside and extreme base whitish or reddish.
4. *tenuiventris*, 3 lines.
B. Apex of abdomen more or less compressed at the sides (males and females).
a. Abdomen black.
Front legs fulvous, base black, hinder black, middle of tibiæ widely and base of tarsi beneath whitish. - 3. *vidua*, 2⅓—3⅓ lines.
b. Middle of abdomen red-marked.
Legs reddish, base black; hind femora brown at apex; hind tibiæ, apex and before the base, and tarsi pale fuscous.
2. *mesozosta*, 3—4 lines.

The species of this genus are distinguished from *Limneria* by having the margin of the eyes against the antennæ notched, but this character is slightly noticeable in certain other *Limnerias*. The metathorax is without areæ, the head is transverse, and the aculeus is very short, scarcely exserted. *C. vidua* is included by Holmgren as a true *Campoplex* in his Monograph. He writes:— "The compact hairy covering on the metathorax conceals the spiracles, and this was the reason that I assigned the species to a wrong place at the time of the publication of the 'Monographia Ophionidum Sueciæ.'" Tschek says the spiracles are "kurzspaltformig"; they are not circular. Desvignes' *C. Henaultii* is certainly this species. It is a common parasite of *Abraxas grossulariata*, having been bred therefrom by Bignell (Entom.

xiii. 246), Raynor, Weston, and ourselves; its thick, double-banded cocoon is figured on Plate ii., fig. 11. Of *C. tenuiventris*, Gravenhorst says (I. E. iii. 483) that Nees bred a female from a cocoon with two fasciæ and the base black, it was parasitic on *Amphidasys betularia;* whilst Sturm bred it from a 2½ line long, white, ovate cocoon, spotted with black, and with two black bands (*cingulis*); Bignell has bred it from *Hemithea thymiaria* and *Hybernia progemmaria;* cocoon cylindrical (3½ by 1½ lines), very compact, brown, two bands base and apex black; Giraud from *Ephyra punctaria* and Brischke from *Eupithecia pimpinellata. C. orbitalis* has been bred from young larvæ of *Deilephila galii* and from *Anticlea sinuata* by Brischke; cocoon elliptical, rough, whitish, more or less black-spotted at the poles. He also says that *C. senicula*, Gr., pupates in a similar manner to *C. ebeninus*, under the larva of *Orgyia gonostigma* (see p. 18 ante). Tschek has monographed the Austrian species at Verh. z.-b. Gesell. Wien, xxi., pp. 54–59; he includes eleven.

LIMNERIA, *Holmgr.*

SECTION I.—Fore wings without an areolet.

A. Abdomen black.
A. Scape of antennæ black beneath; aculeus of female about half the length of abdomen.
a. Hind femora red.
* Legs red, coxæ black (females).
† Aculeus half the length of abdomen; trochanters and stigma black. *deficiens*, 4⅓—4½ lines.
†† Aculeus scarcely half of abdomen; trochanters and stigma yellow. 28. *exareolata*, 2—2¼ lines.
** Apex and before the base, or base and apex of hind tibiæ dark (females).
‡ Aculeus about half of abdomen. - *vestigialis*, 1½—1¾ line.
‡‡ Aculeus less than half of abdomen. - - 28. *exareolata*, var.
b. Hind femora black.
§ Hind legs almost entirely black; aculeus very short (male and female). - - - - - - 1. *aberrans*, 2 lines.
§§ Hind tibiæ reddish, apex and before the base dark; aculeus about one-sixth of abdomen (male and female). - *Elishæ*, 1½ line.
B. Scape of antennæ pale beneath.
* Scape yellow beneath.
† Hind femora red.
‡ Hind tibiæ reddish, or sometimes apex and before the base brown.
§ Aculeus one-third of abdomen. - 28. *exareolata*, 2—2¼ lines.
§§ Aculeus very short (female). - - - *Fitchii*, 3 lines.
‡‡ Hind tibiæ reddish; apex and before the base dark (male). *vestigialis*, 1½—1¾ line.

†† Hind femora more or less piceous.
× Hind tibiæ reddish or reddish straw, base and apex brownish; aculeus scarcely half of abdomen. 68. *transfuga*, 1—1½ line.
×× Hind tibiæ dark brown, with lighter rings; aculeus two-thirds of abdomen (female). - - - 33. *flaviventris*, 2½ lines.
** Scape reddish beneath.
+ Hind femora red; aculeus scarcely half of abdomen.
↔ Front coxæ red (female). - - - 8. *apostata*, 1¾ line.
↔↔ Front coxæ black (female). - - 28. *exareolata*, 2—2½ lines.
+ + Hind femora black.
Apex of hind tibiæ reddish; aculeus short (female).
croceipes, 2¾ lines.

B. Abdomen red and black.
* Scape black beneath.
† Hind femora red.
Middle of abdomen, femora and tibiæ red; apex of latter dark; aculeus very short. - - - 4. *alienata*, 3—3¾ lines.
†† Hind femora dark.
Sides of abdomen red; hind legs almost entirely black; aculeus very short (female). - - - - 1. *aberrans*, 3 lines.
** Scape pale beneath (males and females).
‡ Legs red; 2nd and 3rd segments of abdomen red; aculeus longer than the 1st segment. - - - 25. *dorsalis*, 2½ lines.
‡‡ Hind legs black; 3rd to 7th segments of abdomen red; aculeus short. - - - - - - 14. *braccata*, 2¾ lines.

SECTION II.—Fore wings with an areolet.

DIVISION 1.—Back of metathorax more or less concave.

A. 2nd segment of abdomen hardly longer than wide.
Black; legs red, coxæ and base of trochanters black; hind tibiæ and tarsi white or whitish; apex and before the base of the former dark, and articulations of the latter dark: aculeus half of abdomen (male and female).
* Sides of post-petiole subrotund. - - 2. *albida*, 2½—3 lines.
** Sides of post-petiole somewhat parallel; hind femora generally dark at the apex. - - 36. *geniculata*, 1½—2½ lines.
B. 2nd segment of abdomen distinctly longer than wide.
Black; legs partly red or pale.
* Scape of antennæ black beneath.
† Flagellum of female marked with white in the middle; legs red; base and apex of hind tibiæ and tarsi brown; aculeus very short (female). - - - - *albovincta*, about 2 lines.
†† Flagellum of female not white-marked; coxæ and hind trochanters black; hind tarsi infuscated; aculeus rather more than half of abdomen (male and female). - 51. *mutabilis*, 2—2¼ lines.
** Scape of antennæ pale beneath.
Legs red, base black, tarsi fuscous; aculeus rather more than half of abdomen (female). - - - 30. *Faunus*, 2½ lines.

Division I.—Back of metathorax not, or scarcely, concave.

Abdomen black, or almost so; scape of antennæ black beneath.
Hind femora red.
Hind tibiæ red, or apex fuscous; rarely base also.
3rd segment of abdomen with a chestnut spot at the side; aculeus one-third of abdomen (female). 44. *lateralis*, 2½ lines.
3rd segment not red-marked.
Aculeus about half of abdomen.
Transverse anal nervure of hind wing geniculated.
Metathoracic areæ obsolete (female). - *robusta*, about 3 lines.
Metathoracic areæ distinct.
3rd segment of abdomen quadrate (female).
22. *difformis*, about 3 lines.
3rd segment of abdomen transverse (female). *ovata*, about 3 lines.
Transverse anal nervure not geniculated.
3rd segment of abdomen quadrate (male and female).
27. *erucator*, about 3 lines.
3rd segment of abdomen transverse (male and female).
cylindrica, 1¾ lines.
Aculeus not more than one-third of abdomen.
Metathorax very short.
Aculeus rather longer than 1st segment of abdomen (male and female). - - - - *Kriechbaumeri*, 2½—3½ lines.
Aculeus shorter than 1st segment. - *vulgaris*, 3—3½ lines.
Aculeus very short, hardly exserted.
Hind tibiæ white at the base. - - *? prussica*, 2¼ lines.
Hind tibiæ not white at the base.
Front coxæ yellow, base dark. - - - *Brischkei*, 3 lines.
All the coxæ black. - - - - 42. *insectator*, 2 lines.
Apex and before the base of hind tibiæ dark.
Hind tibiæ white.
Coxæ black, front ones more or less pale beneath at the apex.
Margin of hind segments castaneous: aculeus about one-third of abdomen (female). - - - 73. *viennensis*, 2½ lines.
Margin of hind segments black.
2nd segment of female transverse: aculeus one-third of abdomen.
52. *nana*, 1½ line.
2nd segment of female not transverse: aculeus rather less than half of abdomen.
Hind femora entirely red. - 18. *cerophaga*, 2¼—2⅜ lines.
Hind femora black at the base. - - ?11. *arvensis*, 2—2½ lines.
Front and part of middle coxæ yellow.
Aculeus about one-third or one-fourth of abdomen.
67. *tibialis*, 2½ lines.
Aculeus about one-sixth of abdomen.
First petiole quadrate: supero-medial area transverse: sides of 2nd and 3rd segments often more or less red. *virginalis*, 2¾ lines.
First petiole longer than wide: supero-medial area elongate.
37. *gracilis*, 1¾—2½ lines.
Hind tibiæ [illegible]

-+- Aculeus about as long as the abdomen (female).
66. *sordida*, 2—2½ lines,
-+--+- Aculeus about half of abdomen (male and female).
+-+ Aculeus slightly curved upwards.
∽ 2nd segment of female quadrate. - 62. *rufipes*, 2½—3 lines.
∽∽ 2nd segment one-third longer than wide. 47. *majalis*, 2—3 lines.
∽∽∽ 2nd segment twice as long as wide. - 23. *dispar*, 2—2⅔ lines.
+-++-+ Aculeus describing half a circle. - - *curvicauda*, 1⅓ line.
c. Base and apex of hind tibiæ dark.
* Aculeus about half of abdomen.
† Aculeus strongly curved upwards; marks on hind tibiæ faint (male and female). - - 34. *flexicauda*, 1¼—1⅓ line.
†† Aculeus slightly curved; marks on hind tibiæ black (male and female).
‡ Hind coxæ black. - - - - - - *interrupta*, 2 lines.
‡‡ Hind coxæ red. - - - - - - - *coxalis*, 3—3½ lines.
** Aculeus one-fourth of abdomen (female). - 58. *parvula*, 2 lines.
B. Hind femora dark.
a. Hind tibiæ red.
Front femora and tibiæ red; aculeus very short (male and female). - - - - - 39. *immolator*, 2⅓ lines.
b. Base and apex of hind tibiæ dark.
* 2nd segment of female transverse; middle of hind tibiæ piceous; aculeus very short (male and female).
† Hind tibiæ in the middle-outside testaceous.
69. *tristis*, 2½—3 lines.
†† Hind tibiæ red. - - - - 39. *immolator*, 2⅓ lines.
** 2nd segment of female not transverse.
‡ Aculeus of female very short; head transverse (male and female).
55. *obscurella*, 2½ lines.
‡‡ Aculeus of female one-fourth of abdomen (male and female).
57. *Paniscus*, 2½ lines.
‡‡‡ Aculeus of female half of abdomen; head subbuccated (male and female).
§ Margin of 2nd segment castaneous. - 29. *exigua*, 1—1⅔ line.
§§ Margin of 2nd segment not castaneous. - *cursitans*, 1⅔ line.
c. Apex and before the base of hind tibiæ dark.
* Aculeus about half of abdomen (female). *volubilis*, about 2 lines.
** Aculeus a little longer than 1st segment (female).
lugubrina, 1½—2 lines.
*** Aculeus one-sixth of abdomen (female). - 7. *annulata*, 2⅓ lines.
**** Aculeus subexserted (male and female). 3. *albipalpis*, 2⅔—3½ lines.
B. Abdomen black, or almost so; scape of antennæ pale beneath.
A. Hind femora red; aculeus very short.
a. Hind tibiæ red, or apex dark.
* Apex of 1st to 3rd joints of hind tarsi pale (male and female).
65. *sericea*, 2½ lines.
** Hind tarsi entirely black (males).
† Cubito-discoidal nervure with a nervelet. 53. *nigritarsa*, 2⅓—3 lines.
†† Cubito-discoidal nervure without a nervelet. - ? *clausa*, 3 lines.
b. Base and apex of hind tibiæ dark; hind femora partly red, generally piceous; aculeus short.
41. *inquinata*, 2—2½ lines, female.

c. Apex and before the base of hind tibiæ dark.

* Aculeus at least one-sixth of abdomen.

† Sides of middle segments with obscure castaneous marks; aculeus about half of abdomen (males and females).

‡ Face quadrate or subquadrate, especially of the female.
10. *armillata*, 2—2½ lines.

‡‡ Face transverse. - - - - 19. *chrysosticta*, 2 lines.

†† Sides of abdomen not red-marked; hind femora more or less marked with brown (male and female).

§ Aculeus of female rather less than half of abdomen; flagellum of male antennæ as wide at the base as in the middle.
32. *fenestralis*, about 2 lines.

§§ Aculeus of female about one-sixth of abdomen; flagellum much more slender at the base than in the middle.
37. *gracilis*, about 2 lines.

** Aculeus very short (males and females).
Abdomen, 4th to 6th segments of the belly red.
erythropyga, 2—2½ lines.

× Sides of abdomen sometimes red-marked; supero-medial area somewhat semicircular. - - *clandestina*, 2¼—3 lines.

× × Supero-medial area of metathorax elongate. *hyalinata*, 1½—2 lines.

B. Hind femora black, middle of hind tibiæ pale; aculeus very short.

* Head transverse (female). - - 41. *inquinata*, 2—2½ lines.

** Head buccated (male and female). - 72. *vexata*, 1⅔—2 lines.

(To be continued.)

COLLECTING THE GENUS *EUPITHECIA*.

By John T. Carrington, F.L.S.

In going over our friends' collections during the off-season, one remarks, with few exceptions, upon the shortness of the series, and in many instances the almost total absence of the various species of the genus *Eupithecia*. Beginners, as a rule, rather shirk them, as "being confusing;" but such is not really the case; and a little attention, especially to the earlier stages, will soon familiarise anyone with the specific distinctions of the various British species. Our fauna now counts no less than fifty species, and a collector of but a year or two's experience may get, and even breed, a score and a half different kinds in a couple of seasons. I propose to jot down a few of my recollections of collecting the genus, in the hope that they may induce some, who have hitherto neglected the group, to study them more carefully, and so make a better show of knowledge and examples of "Pugs" when exhibiting their collections another year.

From early spring to latest autumn some representative of the genus may be found. Perhaps the first to be taken is *E. abbreviata*, which occurs at night feeding on the nectar of sallow-bloom, and at rest during the day on the lower boughs of oak trees in woods; a sharp jar from a stout stick will remove them from their resting-place, when females can be taken, and a series reared on oak leaves. From these trees also the larvæ may be beaten during the early summer, being full-fed in the first week of July. It appears to occur everywhere in varying numbers, and should be taken the first season. Although *E. helveticaria* may be counted a rarity, it should be looked for wherever juniper grows freely, on chalk or limestone. In captivity it is one of the first to emerge from pupa, and often comes out as early as the end of January. It is said to fly in May; but it will be well to search for it before that month. The larvæ are full-fed in September, and are to be beaten from juniper in the localities frequented by the species, which are known to be near Edinburgh, Tring, and elsewhere. Perhaps if carefully sought for it could be found in many others.

Eupithecia irriguata may be taken among large oaks about Easter time. The New Forest is the favourite haunt of this species, which has the habit of resting during the daytime on the under sides of the lower boughs, as well as on the tree trunks. If a suitable night could be selected—one without east wind, or any wind in fact—I think light would prove attractive to *E. irriguata.* It is best to obtain a brood of eggs, if possible, and rear them. These larvæ may be "sleeved" on a branch of oak, if opportunity offers, and left to feed themselves. They should be seen from time to time, however, for it is not long since such a brood perished from the too affectionate attentions of a larva of *Calymnia trapezina*, which had hatched out from an egg previously laid upon the enclosed branch. *E. irriguata* is one of the rarer pugs, and is only sparingly found even in the localities frequented by it, which are chiefly old oak woods in the South of England. There is no reason why Sherwood Forest, and likely places further north, should not be explored for it with success. The larva is regularly taken each year in small numbers in June or July in the New Forest by beating oak branches.

Among the spring captures will be *E. indigata*, which one will hardly fail to find in its proper locality—a well-grown fir wood.

It is only necessary to walk through the sad and funereal-looking grove, with a stout stick with which to tap the trees as one passes, and off fly the *indigata.* If larvæ are wanted, and it is worth breeding for it is at best but a shabby-looking species, they may be beaten from fir during July, when they are full-fed. Perhaps larch grows near the firs, when we may expect *E. lariciata.* They also rest on the trunks of the larches in the daytime, but prefer the lower branches. A large spreading tree of this kind will often produce a good series if worked carefully, but the moths require watching, for they possess the habit of dropping straight to the ground, and remaining motionless. I have taken *E. lariciata* from the North of Scotland to the South of England.

By the sides of the woods, when the sallow-catkins are just ready to fall, is the time and place to take the larvæ of *E. tenuiata,* which, like several others of the genus, is more easily collected in the larval than the perfect state. It is only necessary to choose a dry day, and beat the catkins on to a sheet or into an umbrella, and keep them in a large flower-pot with a little earth at the bottom, or other place where they will be dry and unlikely to mould. It is useless to look for each larva of *E. tenuiata* separately; but the moths will come out in June, sometimes in surprising numbers, where not a single larva was observed. The moths have been taken in Yorkshire, the fen-lands, and many other localities. Even if not known to occur in a particular locality it is worth while gathering the catkins, for one is sure to breed something from them. The reverse may be said of *E. pumitata,* for it is much more commonly taken as an imago than in the larval state. In April and late into summer, as there are probably a succession of broods, it may be found all over the three kingdoms at rest on palings, trunks of trees, &c., especially about cultivated lands; though in Scotland it occurs freely even on the highest and bleakest moors. It flies during the afternoon sunshine, as well as at dusk of evening. The larvæ feed upon the flower-heads of many compositæ, but singly, and not semi-gregariously, as is the case with some other species of the genus. The habits of *E. satyrata* are much the same as *E. pumilata,* frequenting palings and tree-trunks in the south, but flying freely in the afternoons on the northern moors. This species varies so greatly according to locality that one is apt, on first seeing it flying plentifully on a Scotch moor, to think we have found something new. No doubt both these latter species feed upon the heather, or ling, in such localities, though some think otherwise. In similar places we find *E. nanata* and *E. minutata*, both flying during the afternoon and evening in early May over heaths. The former wherever the food-plant, heather, occurs, and further north than the latter. Much the best way to obtain a good series of either is to sweep the heather flowers in August and September for the larva, which may be obtained in numbers. That of *E. nanata* is very beautifully marked with pink and white, while the other species is more uniformly coloured. *E. castigata* has the reputation of being one of our commonest moths, but it is more numerous in some localities than others. It occurs singly all over Britain and Ireland, and the larvæ seem to feed singly, and upon almost anything, in July, August, and September. Another, with like habits and time of appearance, is *E. vulgata*. It will be well to rear both these from ova.

Among the late spring-time "pugs" *Eupithecia venosata* is one of the most easily obtained, and certainly one of the prettiest. The imagines are never found far from the food-plants, and flit there-about gently at dusk in May and early June. It occurs in almost every locality where any of the genus *Silene* grows plentifully. Those larvæ which have fed upon *S. maritima* by the sea coast produce generally larger and often darker moths than one breeds from the inland-growing *S. inflator*. It is much better to simply gather the unripe seed-pods in June, July, and even August, put them into a bag about the size of a small pillow-case, tie them up, and leave the larvæ to pupate among the broken leaves, &c. This saves much trouble in looking for individual larvæ. By stretching a hoop within the mouth of the bag, in spring, one can see the moths as they come out. This hoop can be covered with open gauze, a loose place being left for the hand when entering to box the moths as they come out. This feeding of larvæ of *Eupitheciæ* in bags is frequently very successful where the food-plant can be easily gathered in quantities, no earth for the pupæ to change in is needed, and the system is most convenient. The bags are best kept in an outhouse, or other place where not too dry, and the material of which they are made should be fairly open, as to admit of good ventilation, so as to prevent mouldiness. All gatherings should take place when the food-plant is dry, otherwise the success of the experiment is much endangered.

(To be continued.)

THE GENUS *GONIODOMA*, ZELL.

By GEORGE COVERDALE.

THIS genus, which until lately consisted of a single well-defined species, *G. auroguttella*, F. v. R., has been the subject of considerable discussion, due chiefly to an article, from the pen of Mr. H. T. Stainton, in the Ent. Mo. Mag., vol. xxi., p. 59, "On the *Coleophora* of the *Statice limonium*, hitherto erroneously recorded as *Goniodoma auroguttella*, F. v. R." After giving an account of this curious case of mistaken identity, and of Mr. W. H. B. Fletcher's fortunate discovery of the larva of our species, &c., he writes, "I would propose for it the name of *limoniella*; further, as it would hardly be suitable to place it in the genus *Goniodoma*, its habitation not showing any angles, I would prefer to locate it, for the present, at least, in the genus *Coleophora*, of which we now know several species that bore into stems, such as *C. salicorniæ* and the very handsome South Russian *C. argyrella*, H.S.; hence we cannot look upon that habit as furnishing a sufficient justification for separating individual species from the main genus *Coleophora*." If this view be accepted it means the abolition of the entire genus *Goniodoma*, now comprising three species, in favour of placing these insects with the already perplexing hosts of *Coleophora*; for the imago of *auroguttella* is almost identical in structure with that of *limoniella*, and although I have as yet had no opportunity of examining *millierella*, I believe considerable difficulty is experienced in separating it from *auroguttella*. Probably no one would seriously propose to locate *limoniella* and *millierella* in the genus *Coleophora* on account of their cases, whilst retaining *auroguttella* as the sole exponent of *Goniodoma*. If one is a *Coleophora* they all are; to separate them generically seems impossible. The position assumed by Mr. Stainton in this matter appears to me untenable, and I think there is evidence to show that, however inappropriate the designation, the genus *Goniodoma* is a good one, and the insects composing it capable of a firm and clear separation from the closely allied *Coleophora*. Indeed, a careful study of the venation in the latter genus would, I am persuaded, show it to be capable of well-defined subdivision.

Last July, at Shoeburyness, I met with *Goniodoma limoniella* flying in the afternoon sunshine amongst *Statice limonium*. This being my first introduction to the species I was much puzzled (believing it to be attached to *Atriplex*) to account for its evident partiality to the *Statice*, although several species of *Atriplex* were growing in the greatest profusion in the locality.

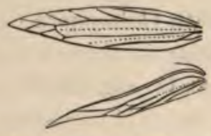
My most striking remembrance of the occurrence was the peculiar manner in which the insect holds its antennæ in repose, —not porrected and nearly parallel as in a true *Coleophora*, but enclosing a considerable angle, at least 45°, and sometimes waving them gently and alternately up and down. When, a few days later, Mr. Stainton's article appeared, I wrote to him stating my recent experience of the species as an argument against the proposed incorporation of the genus with *Coleophora*; he replied that he had not noticed this peculiarity in those which he had bred. Other inquiries which were made convinced me of the accuracy of my observation, which, it is interesting to find strengthened by the latest addition to our knowledge of the habits of *millierella* recorded by Mons. A. Constant from the South of France (Ent. Mo. Mag., vol. xxi., 250, 235). Turning to Fischer von Roeslerstamm's fine 'Abbildungen zur Berichtigung,' &c., we have further evidence in support of my statement. On plate 86 K is a small side view of *auroguttella* at rest, which shows the antennæ porrected but not parallel. If the insect held them parallel they would both be in the same line, and one only could be seen. Plate 87, A, shows the same thing, B and C being enlarged figures which faithfully represent the position of the antennæ in *limoniella*. We should bear in mind, however, that Coleophoræ, with their wings expanded, are generally represented with the antennæ widely separated, but on the whole it seems highly probable that all the species in the genus carry their antennæ in a manner totally different from that as yet recorded of any *Coleophora*, which is of itself significant of a difference in structure and an argument in favour of retaining the genus *Goniodoma*.

It will now, perhaps, be instructive to glance at Zeller's diagnosis of the two genera in the 'Linnæa Entomologica,' Bd. iv., 191. Beitrag zur Kenntniss der Coleophoren. At page 195 we have the following :—

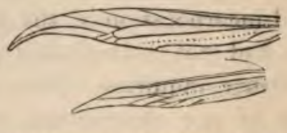
Coleophora, H. Z. Dup.—Alæ anteriores vel lineatæ. Cellula discoidalis venas 7-8 emittet. Metamorphosis intra saccum.

Goniodoma, *m.*—Antennæ penicillatæ, flagello nudo. Alæ anteriores (caudate) postice transverse maculatæ. Cellula discoidalis venas 7 emittet. Metamorphosis extra saccum."

"*Metamorphosis extra saccum*" is now disputed by Mons. A. Constant of *millierella*, and none of the other terms appear precise enough to separate the genus from *Coleophora*. Some of Zeller's further remarks on the venation I am unable to verify; for example "The median nervure ends unbranched (einfach)," and it therefore appeared advisable to give drawings of the venation, and thus enable others to form an opinion as to the distinctness of the two genera.

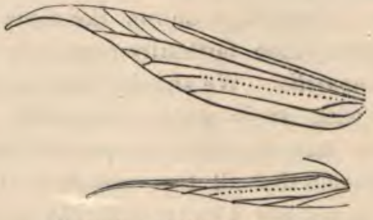


Coleophora lineolella. × 4.



Coleophora lixella. × 4.

The venation exhibited by *Coleophora lineolella* seems to be the prevailing type of the genus, with the fore wings comparatively short and broad. *Coleophora lixella* has the fore wings caudate, the closed discoidal cell much attenuated towards the base, and the 4th subcostal nervule terminates at or about the apex instead of on the costa. In both these species the discoidal cell in the



Goniodoma limoniella. × 8.

hind wings also is seen to be closed. The fore wings of *Goniodoma* *limoniella* are of much the same shape as those of *C. lixella*, but palpable differences in the venation exist, the most important being that the discoidal cell is perfectly open. The subcostal traverses the wing in one bold and unbroken line, its fourth branch terminating on the costa, and the median is seen to be branched.

The hind wing is much narrower than any *Coleophora* I have examined, and the discoidal cell open, but the venation here is very faint and extremely difficult to demonstrate satisfactorily on account of the small size and delicacy of the wing membrane. *C. lixella* is evidently closely allied to *Goniodoma*, holding a position between the two genera. Briefly to recapitulate, the open discoidal cells and almost setiform hind wing, coupled with the habit of holding the antennæ, constitute, to my mind, a sufficient reason for retaining *Goniodoma*, at least, until we see our way to a thorough revision of the whole of the Coleophoridæ.

The larva of *auroguttella* has been figured and described by Fischer von Roeslerstamm (Plate 86), and is, I believe, the only species of the genus at present recorded. The head is yellowish brown; the 2nd, 3rd, 4th, 11th, 12th segments yellow, and the 5th to 10th inclusive whitish. The 13th segment is black above, the 3rd segment being the broadest. The following rough description of the larva of *limoniella* may be useful for comparison. Length about 2‴, width almost uniform, the 2nd segment being slightly broader than the rest. Colour pale yellow throughout. Head rich chitinous brown, 2nd segment with two rounded plates of the same colour, separated by a pale yellow triangular patch, the apex of which points to the head; 3rd segment with two dorsal brown plates and two smaller subdorsal ones, the latter being anterior to the dorsal. Between the 8th and 9th segments two longitudinal internal chitinous structures are visible through the skin, being probably connected with the dorsal vessel. The last segment is protected by a rich brown chitinous plate. There are also small plates on the 2nd, 3rd and 4th segments in the spiracular region. This larva may be found about the end of August on the flower-heads of *Statice limonium* in its case formed of a withered calyx. Later on it bores into the stems to pupate, when the hole is closed up and the case generally drops off.

One of my larvæ bored exceedingly neat holes through a chip pill-box, and another I found had entered the stem of *Atriplex portulacoides*. The precise behaviour of *millierella*, which feeds on the flowers of *Statice virgata*, is not ascertained. Whether pupation takes place in the case or whether the insect be double-brooded are points for future investigation. The larva of *auroguttella* lives in an angular case formed of the seeds of *Atriplex laciniata*, *A. patula*, and *A. latifolia*, and it seems not unlikely that a careful search on other species of Chenopodiaceæ, Plumbaginaceæ, and perhaps Plantaginaceæ and Polygonaceæ, may reveal the existence of other species in this beautiful and interesting genus.

24, Fleming Road, Lorrimore Square, S.E., March 21, 1885.

LEPIDOPTERA IN SOMERSETSHIRE.

By Rev. J. Seymour St. John.

I am sorry to find that Dr. Livett has experienced such a bad season in this part of the county last year. With me it was different, and I was rejoicing over what I took to be signs of better seasons in the future. It will be simpler and take up less space if I shortly enumerate my captures, with the number and variety of species I met with at Crowcombe, in the Minehead Valley. I have before written in the 'Entomologist' concerning what I deem to be the excellency of that locality, speaking entomologically. Perhaps my better success last year only proves this, and not that it was really a better season.

In March I took a very good specimen of *Dasycampa rubiginea* at the blossom of a rose tree: also *Xylocampa areola*, *Cerastis vaccinii*, *Scopelosoma satellitia*, *Selenia bilunaria* (*illunaria*), *Anisopteryx æscularia*, *Anticlea badiata*, several, *Hybernia marginaria* (*progemmaria*), *Cidaria siterata* (*psittacata*), *Diurnea fagella*.

In April, through the cold east winds, my only captures were:—*Pieris napi*, *Gonoptera libatrix*, common here, *Eucosmia certata*, and *Coremia designata* (*propugnata*).

May yielded a very good harvest, my note-book showing:—*Pieris brassicæ*, *P. napi*, *P. rapæ*, all equally common, *Pararge egeria*, common, *P. megæra*, *Vanessa cardui*, *Euchloë cardamines*, *Argynnis euphrosyne*, common, *Cœnonympha pamphilus*, *Spilosoma fuliginosa*, *Gonoptera libatrix*, *Anarta myrtilli*, very common, *Hadena contigua*, *Rumia luteolata* (*cratægata*), very common, *Ematurga atomaria*, abundant, *Selenia bilunaria*, *Coremia* *ferrugata*, several, *C. suffumata*, common, *C. designata*, *Anticlea nigrofasciaria* (*derivata*), *Cidaria silaceata*, *C. truncata* (*russata*), common, *C. corylata*, *Venilia macularia*, *Pachycnemia hippocastanaria*, *Melanippe fluctuata*, *M. sociata* (*subtristata*), *Cabera exanthemaria*, *Phytometra viridaria*, *Numeria pulveraria*, *Tephrosia crepuscularia*, *Odontopera bidentata*, *Melanthia ocellata*, *Emmelesia affinitata*, common, *Acidalia fumata*, several, and *Alucita hexadactyla*.

June produced a far better variety and number of insects than the previous year; and if I had had more time to devote to the science, I could, no doubt, have shown up a still better "bag." What I did capture were: — *Argynnis selene*, *Demas coryli*, *Hepialus hectus* and *H. lupulinus*, common, *H. humuli*, common, *H. velleda*, several, *Spilosoma menthastri* and *S. lubricipeda*, both common, *Phalera bucephala*, *Lophopteryx camelina*, *Thyatira batis*, *Noctua festiva*, *Agrotis exclamationis*, not so abundant as last year, *A. strigula*, *Gonoptera libatrix*, *Xylophasia rurea*, *X. hepatica*, *X. monoglypha*, *Triphæna pronuba*, *Miana fasciuncula*, *Rusina tenebrosa*, *Apamea basilinea*, *A. didyma*, *Mamestra sordida* (*anceps*), *Numeria pulveraria*, *Rumia luteolata*, abundant, *Asthena candidata*, *Acidalia fumata*, several, *Cabera exanthemata*, *C. pusaria*, *Cidaria designata*, *C. truncata* (and v. *perfuscata*), *C. suffumata* v. *piceata*, *C. immanata*, *C. fulvata*, common, *C. testata*, *C. dotata*, *Eupithecia exiguata*, *Ebulea sambucalis*, *Boarmia repandata*, common, *Melanippe montanata*, abundant, *M. fluctuata*, *Panagra petraria*, *Selenia bilunaria*, *Ligdia adustata*, *Metrocampa margaritaria*, *Timandra amataria*, *Tenegra atrata*, *Melanthia ocellata*.

July, like the previous month, brought me some species I had not before captured in the district, and I had no reason to complain, though "sugaring" did not quite come up to my anticipations. My list was as follows:—*Vanessa cardui*, *Epinephele tithonus*, *E, janira*, *Bombyx quercus*, *Hepialus humuli* and *H. hectus*, both common, *Plusia gamma*, common, *Xylophasia hepatica*, *X. monoglypha* (*polyodon*), *Aplecta nebulosa*, *Thyatira batis*, several, *T. derasa*, *Agrotis exclamationis*, *A. strigula*, *Leucania comma*, *L. pallens*, *Triphæna pronuba*, *T. fimbria*, *T. janthina*, *Cucullia umbratica*, *Mamestra persicariæ*, *M. brassicæ*, common, *Miana fasciuncula*, *M. strigilis*, *Hydræcia nictitans*, *Apamea didyma*, common, *Mania maura*, *Cidaria picata*, *C. fulvata*, *C. prunata*, *C. immanata*, *C. truncata*, *Boarmia repandata*, *B. gemmaria*, *Melanthia albicillata*, *Rumia luteolata*, *Emmelesia decolorata*, *Cabera pusaria*, *Acidalia aversata*, common, *A. bisetata*, *Larentia didymata*, common, *Macaria notata*, *Metrocampa margaritaria*, several, *Ligdia adustata*, *Iodis lactearia*, *Eubolia plumbaria*, common, *Nemeophila russula*, *Eupithecia nanata*, common, *E. oblongata*, *E. subfulvata*, *Timandra amataria*, *Hemithea strigata*, *Halia vauaria*, *Lomaspilis marginata*, *Uropteryx sambucaria*, several, *Hypsipetes sordidata*, common, *Selenia lunaria*, *S. bilunaria*, *Camptogramma bilineata*, abundant, *Melanippe rivata*, *M. sociata*, *Zanclognatha tarsipennalis*, and *Crambus pinellus*.

August could not show so long a list as the two previous months, as I was away in the Isle of Wight and elsewhere during three parts of it; still I obtained *Vanessa io*, a large number from the larvæ found, *V. cardui*, abundant, *Hepialus sylvanus*, *Aporophila lutulenta*, *Apamea didyma*, *Larentia didymata*, *Melanthia ocellata*, *Cidaria testata*, and *C. truncata*.

September was a successful month, owing to warm nights and beautiful ivy-blossom. My captures were: — *Argynnis paphia*, *Vanessa cardui*, *V. atalanta*, common, *Notodonta dictæa*, from larvæ found, *Noctua glareosa*, *N. umbrosa N. c-nigrum*, *Neuronia popularis*, *Anchocelis rufina*, common, *A. litura*, *Agrotis suffusa*, common, *A. segetum*, *A. saucia*, *Triphæna janthina*, *Tapinostola fulva*, *Amphipyra pyramidea*, several, *Calocampa vetusta*, *Orthosia macilenta*, *Xylina socia* (*petrificata*), common, *Xanthia circellaris*, and *Cerastis vaccinii*. Also one larva of *Atropos* fully grown.

October brought me some real good sport at the ivy-blossom and sugar, and insects were plentiful, coming freely to both. I netted *Triphæna orbona*, *Xylina socia*, *X. ornithopus* (*rhizolitha*), several, *Anchocelis rufina*, *A. pistacina*, *A. litura*, *Xanthia aurago*, *X. circellaris*, common, *Agrotis saucia*, *A. suffusa*, *Orthosia lota*, common, *O. macilenta*, abundant, *Cerastis vaccinii*, abundant, *C. spadicea*, *Scopelosoma satellitia*, *Miselia oxyacanthæ*, *Cidaria miata*, and *C. siterata*, several.

With the above list before me I can feel not only satisfied, but thankful.

Whatley Rectory, Frome, February 7, 1885.

NATURAL HISTORY NOMENCLATURE.

By C. S. Gregson.

In defence of my questioned right to name a species after an individual, I must remind your readers of what has been done by others in a like manner. It is suggested that some board of reference should be constituted, before which proposed names should be submitted. But would it be possible to get anyone to act upon it? Take the names of some of the present leading entomologists, and see if they could.

Every gentleman who has been President of the Entomological Society of London, except Mr. S. Stevens, including the present President (with *Lithocolletis dunningella*, Stainton), has had a species named after him by some member of the Council or other naturalist; and nearly every assistant on the staff of the 'Entomologist' and 'Entomologist's Monthly Magazine' is in the same predicament. Dr. Knaggs christened *Nonagria bondii* (Kngs.); Stainton has given *Gelechia knaggsiella*, and other names after many of his friends; and it is only a few weeks since his last individual name, "*hodgkinsoni*," appeared.

I append a long list of individual names given by all the most eminent entomologists in different countries; and after reading them I do not see that objection can be taken to naming species after individuals. And as regards genera, both *Zelleria* after Zeller and *Banksia* after Sir Joseph Banks are in general use.

Since Linnæus wrote his descriptions and gave his names (from 1761—7), up to 1884, we find immense numbers of these personal names.

Among Coleoptera for example :—

Nebria gyllenhalii, *Scho.*, Chlænius schrankii, *Duftr.*, Ste. skrimshiranus, *Step.*, Aëpus robinii, *Lab.*, Bem. fockii, *Hum.*, B. clarkii, *Daws.*, B. schuppelii, *Dej.*, B. sturmii, *Panz.*, Cybister rœselii, *Fab.*, Agabus sturmii, *Gyl.*, Hyd. davisii, *Curtis*, H. gyllenhalii, *Schiodte*, Euryusa kirbyi, *Janson*, Aleo. kirbyii, *Steph.*, Myrm. haworthi, *Steph.*, Homalota thomsoni, *Janson*, Stenus guynemeri, *Du Val*, S. erichsoni, *Jan.*, S. kiesenwetteri, *Ros.*, Homalium allardi, *Fairm.*, Choleva kirbii, *Spence*, C. watsoni, *Spence*, C. wilkinii, *Spence*, Scydmæus sparshallii, *Denny*, Anomala frischii, *Koppe*, A. donovani, *Marsh*, A. zenkeri, *Germar*, A. schonherri, *Gyl.*, Conopalpus vigorsii, *St.*, Anthicus schaumii, *Woll.*, Anaspis geoffroyi, *Mull.*, Apion gyllenhalii, *Kirby*, A. spencii, *Kirby*, A. curtisii, *Kirby*, A. waltoni, *Steph.*, A. hookeri, *Steph.*, A. germari, *Wal.*, A. schönherri, *Waterhouse*, Sitones waterhousei, *Schol.*, Tychius schneideri, *Herb.*

Are these enough to prove we have long had a system of naming after individuals in the Coleoptera alone; if not, then take the phytophagous Hymenoptera—I have before me, as I write, *Ten. fletcheri* and *saundersi;* or let us examine the Tortrices among Lepidoptera :—

Lecheana, *Linn.*, hartmanniana, *Linn.*, schulziana, *Fab.*, ratzburgiana, *Sor.*, daliana and bouchardana, *Doub.*, hawkerana, *Stainton*, penziana, *Thumb.?* colquhounana, *St.*, P. mitterbacheriana, *W. V.*, paykulliana, *Linn.*, S. heegerana, *Dup.*, weirana, *Douglas*, D. petiverana, *Linn.*, C. wimmerana, *Tr.*, hohenwarthiana, *W. V.*, C. audouinana, *Dup.*, A. baumanniana, *W, V.*, schreibersiana, *Frol.*, C. francillana, *Fab.*, and smeathmammiana, *Fab.*

In the Tineidæ the Vienna Catalogue gives :—

E. steinkellneriella, *Zell.*, zinckenella, *Hub.*, oehlmanniella, *Fab.*, thungerella, *Linn.*, swammerdamella, *Zell.*, schwarziella, *Linn.*, degeerella and the Vienna catalogue, schiffermillerella, &c.

If we take examples from our birds we find the principle of giving individual names has been long practised. Thus we have :—*Noctua tengmalmi* of Selby (Tengmalm's owl); *Totanus bartramia*, Wilson (Bartram's sandpiper); *Tringa schinzii*, Brehm (Schinz's sandpiper),—this bird is also called *Tringa bonapartii; Tringa temminckii*, Leister (Temminck's stint). But surely I have given sufficient illustrations; if not I have only to lift my head, as I write in my museum, and see before me the fork-tailed petrel, *Procellaria leachii;* or Jenyns' Bulwer's petrel, *Thalassidroma bulwerii;* and Sabine's snipe, *Scolopax sabini*, Vigors; or turn round and see Richardson's skua, Bonaparte's gull (*Larus bonapartii*, Audubon), &c.: all of which remind me of many a pleasant day's collecting.

Were I to take Botany or Conchology these individual names would be so numerous that your readers would soon say—hold, enough.

Linnæus, the inventor of the binominal system, had few preceding or contemporaneous entomologists to honour; but what he had he utilised,—Réaumur, Swammerdam, Leuwenhoeck, Frisch, Roesel, DeGeer, Clerck, Geoffroy, &c.; all appear, as named by him, in our lists to-day.

I think that even the objectors to this system of nomenclature have enough before them to show precedent for giving names in honour of those fellow-workers in science whom we may admire.

Rose Bank, Fletcher Grove, Edge Lane, Liverpool, Feb. 10, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Scientific Nomenclature.—As Mr. Chitty says, the custom of naming new species and varieties after individuals is a most objectionable one, and gives infinite trouble and annoyance to those who come after. It is difficult enough to remember reasonable names, without having one's memory taxed with a lot of names which are difficult to spell, difficult to remember, and in the case of some of the Russian names, at any rate, western entomogists find, almost impossible to pronounce. Nor is the malady confined to entomologists; every branch of Natural History is infested with these objectionable names. I take up, for instance, a copy of Kobelt's list of European shells, and at once I am met with such names as *Forchthammeri*, *Kickxii*, *Krynickii*, *Karpinskyi*, *Erjaveci*, *Pulskyana*, and so on ad infinitum. And since these foreign names are so difficult for us to remember and so hard to pronounce, we must not forget that the English names are very likely equally annoying to foreigners. —T. D. A. Cockerell; 51, Woodstock Road, Bedford Park, W., February, 1855.

NOTE ON VANESSA ATALANTA.—When watching some straw being taken out of a barn on the 15th January last, I observed three specimens of *Vanessa atalanta* on one of the bundles; two were dead, but the other was living, and on being removed to a warm room was soon flying about. Might not the dead specimens give a clue to the comparative rarity of hybernated specimens of this species being observed, some being too delicate to live through the winter? They were close together when seen, and were very much worn. If any of your readers could recall a similar case they would perhaps kindly let me know.—R. FREER; Gonville and Caius College, Cambridge.

CHŒROCAMPA CELERIO AT RETFORD.—I have to record the capture last November, I think for the first time here, of *C. celerio*. It was taken from a tree in an orchard, and brought to me alive in a match-box, in which it had remained for many hours.—STEPHEN PEGLER; Retford.

DEIOPEIA PULCHELLA IN CORNWALL.—I think it may be of interest to your readers to know that on September 16th last I took a very fine and perfect specimen of *D. pulchella*, at the Lizard, Cornwall. I happened to be walking across the Downs about 3 p.m., when the insect started from amongst the heath.—ALFRED H. JENKIN; Trewirgie, Redruth, March 9, 1885.

ERIOGASTER LANESTRIS.—In the French work, entitled 'Faune Entomologique Française,'—Lépidoptères, by M. E. Berce, President of the Entomological Society of France, published 1867–8,—familiar no doubt to many,—the following occurs concerning *Eriogaster lanestris*:—"The perfect insect emerges in September and October for the first time; in March, April and May of the following year for the second time,—at least in the neighbourhood of Paris, Bordeaux, Besançon, &c.; for, according to Messrs. Constant, Guillemot, and Peyerimhoff, it only has one emergence—that of September—in the departments of Saone et Loire, Puy de Dôme, and Alsace." Has it ever so emerged in this country? If the warmer temperature of the summer months in France is the cause of the autumnal appearance of the perfect insect, why might it not be "forced" in this country? Perhaps some of your readers can inform me if this has been tried.—T. B. JEFFERYS; Pacific House, Clevedon, March 10, 1885.

Bryophila algæ.—I desire to ask about this rarity. How many have been taken in this country? I know of two only, which are in Mr. Sidebotham's collection, taken near Strines (Marple), near Manchester. If I remember rightly they were taken *in copulâ*, and brought to Mr. Sidebotham alive. He gave one to Mr. Edleston, the other he kept. Afterwards, when he purchased Mr. Edleston's collection, he got the other specimen back again; and I suppose it still remains in his fine collection. I have seen others,—a pair (reputedly British, of course) in a good collection; in another, even a series; but in the last case the owner knew nothing about their history.—J. B. Hodgkinson; Spring Bank, Preston, February 11, 1885.

Grapholitha (?) cæcana.—While collecting in the neighbourhood of Deal, in July last, I captured a specimen of *Grapholitha* (?) *cæcana*, which Mr. Sang, of Darlington, kindly named for me. This has been confirmed by Mr. Coverdale, the first captor of the species in Britain. The specimen is a fine female, very dark in colour.—J. Tutt; 45, Beaconsfield Terrace, Greenwich, S.E.

The Influence of Weather upon Lepidoptera.—From the following observations, amongst others, made during last year, it would seem that hot, no less than excessively wet, seasons have a prejudicial effect upon the transformations of Lepidoptera. In July, in "digging" coast sand-hills, I found twenty or thirty dead pupæ to one live one. Of course there were a few empty cases; but the dead pupæ far outnumbered both empty cases and live pupæ. Again, in working ivy, one-fourth of the specimens obtained were cripples.—George Balding; Ruby Street, Wisbech, February 16, 1885.

Melanic Variation in Lepidoptera of High Latitudes.—Lord Walsingham, in his interesting address on this subject (Entom. xviii. 80) to the members of the Yorkshire Naturalists' Union on the 3rd instant, observes that the tendency to variation in many northern forms of Lepidoptera is in the direction of melanism, and that this tendency is observable in the majority of the Lepidoptera of the whole Arctic and Subarctic regions when contrasted with their more southern representatives. To this rule there are, however, some exceptions, and Mr. McLachlan, in a paper on the subject of "Variation in Lepidoptera" (Trans. *Ent. Soc. Lond.*, 1865), after enumerating a number of species which vary in the direction of melanism when occurring in the North of England and Scotland, observes that "on the contrary, there are a few species which become paler the further we proceed north." As instances of this he cites *Fidonia* (*Bupalus*) (*piniaria*) and *Cidaria corylata*. To these two species I would add *Cœnonympha typhon* (*davus*), the southern or English form of which is, in my experience, a much darker insect, both on the upper and under sides, than the northern or Scotch form, although the latter frequently occurs at a great elevation on the mountains. I have collected a long series of this species in Lancashire and Westmoreland, at an elevation of not more than four or five feet above the sea-level, which consists entirely of *dark* specimens, whereas the specimens I have received from Perthshire and other Scotch counties—many of which were, I believe, taken at a great elevation above the sea level—are all very light in colour, both on the upper and under sides; and the late Henry Doubleday possessed two specimens of *C. typhon* from the Orkneys which were almost white.—Herbert Goss; Surbiton Hill, March, 1885.

Lepidoptera in County Cork.—On the 20th of June last year I captured a specimen of *Melitæa artemis* on the top of a hill at least 300 feet above the sea-level near here. I had never seen the insect before, and was much surprised at meeting with it at such an altitude, for I always thought it a marsh butterfly. On the 22nd another was taken in the middle of the city of Cork, and on the 25th I took the third at least ten miles from the place where I caught the first. In the middle of August, about the 20th, I caught two specimens of *Colias edusa*, and saw two others, but seeing and catching this insect are not always the same operation. Three others were afterwards observed, all of which were males. Beyond *M. artemis*, *Argynnis paphia* is our only other Fritillary here, and that species is wonderfully common. Of other insects worth mentioning, I may enumerate *Satyrus semele*, *Macroglossa stellatarum*, *Procris ino*, and *Geometra papilionaria*. In the January number Mr. Sang records as exceptional a female *Hepialus humuli* taken during the end of August. The grass about our house teemed with these and with *H. lupulinus* last year, and between August 20th and September 9th I saw no less than five of the former moth.—Harry C. Sandford; Bellevue Park, Military Road, Cork.

BRYOPHILA ALGÆ.—I desire to ask about this rarity. How many have been taken in this country? I know of two only, which are in Mr. Sidebotham's collection, taken near Strines (Marple), near Manchester. If I remember rightly they were taken *in copulâ*, and brought to Mr. Sidebotham alive. He gave one to Mr. Edleston, the other he kept. Afterwards, when he purchased Mr. Edleston's collection, he got the other specimen back again; and I suppose it still remains in his fine collection. I have seen others,—a pair (reputedly British, of course) in a good collection; in another, even a series; but in the last case the owner knew nothing about their history.—J. B. HODGKINSON; Spring Bank, Preston, February 11, 1885.

GRAPHOLITHA (?) CÆCANA.—While collecting in the neighbourhood of Deal, in July last, I captured a specimen of *Grapholitha* (?) *cæcana*, which Mr. Sang, of Darlington, kindly named for me. This has been confirmed by Mr. Coverdale, the first captor of the species in Britain. The specimen is a fine female, very dark in colour.—J. TUTT; 45, Beaconsfield Terrace, Greenwich, S.E.

THE INFLUENCE OF WEATHER UPON LEPIDOPTERA.—From the following observations, amongst others, made during last year, it would seem that hot, no less than excessively wet, seasons have a prejudicial effect upon the transformations of Lepidoptera. In July, in "digging" coast sand-hills, I found twenty or thirty dead pupæ to one live one. Of course there were a few empty cases; but the dead pupæ far outnumbered both empty cases and live pupæ. Again, in working ivy, one-fourth of the specimens obtained were cripples.—GEORGE BALDING; Ruby Street, Wisbech, February 16, 1885.

MELANIC VARIATION IN LEPIDOPTERA OF HIGH LATITUDES.—Lord Walsingham, in his interesting address on this subject (Entom. xviii. 80) to the members of the Yorkshire Naturalists' Union on the 3rd instant, observes that the tendency to variation in many northern forms of Lepidoptera is in the direction of melanism, and that this tendency is observable in the majority of the Lepidoptera of the whole Arctic and Subarctic regions when contrasted with their more southern representatives. To this rule there are, however, some exceptions, and Mr. McLachlan, in a paper on the subject of "Variation in Lepidoptera" (Trans. *Ent. Soc. Lond.*, 1865), after enumerating a number of species which vary in the direction of melanism when occurring in the North of England and Scotland, observes that "on the contrary, there are a few species which become paler the further we proceed north." As instances of this he cites *Fidonia* (*Bupalus*) (*piniaria*) and *Cidaria corylata*. To these two species I would add *Cœnonympha typhon* (*davus*), the southern or English form of which is, in my experience, a much darker insect, both on the upper and under sides, than the northern or Scotch form, although the latter frequently occurs at a great elevation on the mountains. I have collected a long series of this species in Lancashire and Westmoreland, at an elevation of not more than four or five feet above the sea-level, which consists entirely of *dark* specimens, whereas the specimens I have received from Perthshire and other Scotch counties—many of which were, I believe, taken at a great elevation above the sea level—are all very light in colour, both on the upper and under sides; and the late Henry Doubleday possessed two specimens of *C. typhon* from the Orkneys which were almost white.—HERBERT GOSS; Surbiton Hill, March, 1885.

LEPIDOPTERA IN COUNTY CORK.—On the 20th of June last year I captured a specimen of *Melitæa artemis* on the top of a hill at least 300 feet above the sea-level near here. I had never seen the insect before, and was much surprised at meeting with it at such an altitude, for I always thought it a marsh butterfly. On the 22nd another was taken in the middle of the city of Cork, and on the 25th I took the third at least ten miles from the place where I caught the first. In the middle of August, about the 20th, I caught two specimens of *Colias edusa*, and saw two others, but seeing and catching this insect are not always the same operation. Three others were afterwards observed, all of which were males. Beyond *M. artemis*, *Argynnis paphia* is our only other Fritillary here, and that species is wonderfully common. Of other insects worth mentioning, I may enumerate *Satyrus semele*, *Macroglossa stellatarum*, *Procris ino*, and *Geometra papilionaria*. In the January number Mr. Sang records as exceptional a female *Hepialus humuli* taken during the end of August. The grass about our house teemed with these and with *H. lupulinus* last year, and between August 20th and September 9th I saw no less than five of the former moth.—HARRY C. SANDFORD; Bellevue Park, Military Road, Cork.

LEAF-MINING DIPTERA IN 1884.—The Snow-berry bushes (*Chiococcos racemosa*), planted frequently in pheasant-preserves for the sake of the white berries, which are said to be relished by our game birds, have been this year covered with their pretty white mines. Scarcely a leaf has been without its characteristic scroll. I noticed the fly, indeed, ovipositing at the close of April, and the mining of the larva was easily seen in June, and even earlier. The fly appeared in the beginning of July, and is by no means difficult to rear. I believe this to be the identical species recorded by Weyenbergh as occurring on the Snow-berry at Haarlem, and named by him "Haarlemensis." He says that the second generation remains in pupahood throughout the winter. The leaves of the fragrant white melilot gave evidence, apparently, of the mines of the *Phytomyza affinis*, of Macquart, the pupa-case being black, and imbedded in the pulp of the leaf. I was much interested in the exits of the fly, but, unfortunately, all were ichneumoned, and not a single miner appeared. Judging, however, by the artistically formed mine and other attendant circumstances, I have little doubt that the miner was *P. affinis*, of Macquart, my old acquaintance of 1882; and I am the more led to think so since the pea and the melilot are so closely allied. That most polyphagous of the Phytomyzidæ, *P. albiceps*, emerged on the 31st of July from its pupa-case attached to the leaf of *Angelica sylvestris*. Kaltenbach actually mentions sixteen plants that furnish food to this ubiquitous little fly. Among the plants recorded are seven of the Composites, four of the Labiates, three Umbellifers, a poppy wort, a Valerian wort, and one of the Borage worts. I could add a few more, chiefly from among the Composites. The last miner I have to record is *Phytomyza glechomæ*, Kaltenbach, that makes a conspicuous scroll on the surface of the ground ivy leaf, that reminds me somewhat of the appearance of a volume of steam from the funnel of a railway-boiler. The mines have been not uncommon this year on plants that have grown in shady places overhung with tree foliage. As I gave a detailed account of this *Phytomyza* in the December number of the 'Entomologist' of last year (Entom. xvi. 285), it will be superfluous to repeat the account.—PETER INCHBALD; Fulwith Grange, near Harrogate.

CHOLEVA SPADICEA NEAR NOTTINGHAM.—At the commencement of January I was fortunate enough to find *Choleva spadicea* at the root of a tree near Nottingham. The Rev. W. W. Fowler was kind enough to name it.—Thomas Ludgrove; 21, Lytton Street, Long Edge Lane, Nottingham, March 16, 1885.

A Reflector for Examining the ventral surface of Lepidoptera.—This instrument, which I have recently designed, is of easy construction and exceedingly simple, both in application and principle. It has been of great service to me, and the hope that others may avail themselves of its advantages is the motive for the following publication of its details. A thin glass microscopic circle, about one inch in diameter, is silvered and converted into a good mirror; a stout piece of wire, forming a handle, is beaten out at one end for about an inch, turned down at right angles, and the mirror mounted upon the flattened end, face upwards, with shellac softened in spirit, or any other cement. By the use of this contrivance the entire under sides of butterflies, &c., can be examined without their removal from the cork. It is only necessary to pass the mirror underneath the insect to obtain a good reflection of the wings, legs, anus, and organs of the mouth. By inclining the mirror at different angles various aspects of the face and palpi may be seen. I have found it particularly useful in the examination of Lycænidæ and Satyridæ. It succeeds best with insects mounted high up on the pins; but even when there is only just room to slide the mirror underneath it may be employed with effect.—Geo. Coverdale; 24, Fleming Road, Lorrimore Square, S.E., February 14, 1885.

Naphthaline. — There appears in the 'Entomologist' (Entom. xviii. 55) a note from Miss R. M. Sotheby referring to lump naphthaline. As I was the first person to mention this now generally-used substance, may I say that entomologists ought to be careful as to lump naphthaline? I have not seen that used by Miss Sotheby; but some time since a friend showed me a drawer, in the cells of which he had put some of this lump naphthaline, where the glass of the drawer and also the paper and insects were covered with black specks, which seemed to stick to everything in the drawer. I can only put this down to impure naphthaline, that is possessing iron and other impurities. The naphthaline I advocated some years ago in this Journal was that known as purified, in pure white crystals, very much resembling the flakes of nitrate of silver, as used in photography. Your readers will at once see the trouble and probable loss in having one's insects covered with these innumerable specks. The kind mentioned by Miss Sotheby must certainly be better than the lumps as supplied from Germany, and which I complain of. The pure crystals are much more expensive, but in the end I think the dearest the cheapest.—EDWARD COOKE; 30, Museum Street, London, W.C., March 7, 1885.

EXCHANGING.—In marking his lists a beginner will, of course, start by marking the names of those insects which he has obtained, and leaving unmarked those which he does not possess. At first the blanks will preponderate: in the course of time the number of species marked and the number of blanks will become equal, while afterwards the blanks will go on decreasing. It is this state of our lists that Mr. Raynor objects to. But what would he have? Either we must all begin again a new list, as soon as the old one is half-full, or we must start at first by marking every species, and scratch each mark out as we acquire it. I venture to think that the former plan would be productive of much greater waste of time to the writer, and the latter of much greater confusion to the reader, than the present system. Moreover, I do not see how the reader wastes more time in looking for the blank spaces, as now, than he would in looking for the marks. Secondly, as to the giving away of insects. In former times, I take it, the number of first-class collectors in England might be counted on the fingers, while the total number must have been very small, and all who collected then did so for the love of the pursuit and not for greed or gain. There was no system of exchange as now,—there was neither scope nor reason for it; but, rather than throw away or destroy superfluous specimens, the richer collectors would give them to those who had them not, and thereby lend encouragement to the study. Now, thanks to the impulse given to Entomology, in the first instance by the works of Messrs. Stainton and Newman, and regularly sustained since, there is quite an army of entomologists in the United Kingdom, dealers as well as amateurs. Scope has thus been found for exchange, and a regular system introduced. At the present day promiscuous giving would be somewhat invidious: there are so many willing recipients of gifts. Besides this, the number of dealers renders it comparatively easy to obtain, at all events, types of any species we may require. I do not say that no giving takes place among friends; and there is certainly one well-known and amiable enthusiast who yearly throws open his duplicate boxes to all beginners who may be in want of specimens.—W. Warren; Merton Cottage, Cambridge, January 1, 1885.

Exchanging.—I perceive that Mr. Coverdale admits, in the February number (Entom. xviii. 48), the suggestion thrown out by the Rev. Mr. Raynor in the January number (Entom. xviii. 23), that entomologists are to-day more selfish than of yore. I do not think this is so at all; but the times have changed. Thirty years ago there was only one entomologist where there are now thirty who collect, and an invitation which then attracted twenty or thirty would now bring 300 applicants! Mr. Raynor makes it a virtue to have an appreciation of the value of time. Let him calculate how long it would take to receive, re-pack, address and despatch 300 boxes, accompanied probably by notes apologising for sending two insects when twenty-four were asked for, or for having to return an empty box. It would be a great undertaking, and moreover a most ungrateful one. I remember that some six years ago a case of the kind occurred. The late Mr. E. Birchall advertised 500 *Zygæna pilosellæ* (*minos*) in this manner. He received 200 applications; distributed his 500 insects among 170 in twos and threes; returned some empty; and, in consequence, a number of insulting letters and reproaches instead of thanks.—Stephen Pegler; Retford, February 23, 1885.

A Reference Collection.—I cannot but think that giving away specimens on a large scale is injurious both to the giver and to the recipient. It seems to me like giving a penny to the habitual beggar, an apparent kindness which really only induces sloth and not activity. It is not as if beginners had nothing to give in exchange; anyone, beginner or not, may with a little hard work find many local and rare species in his district, however poor it may be; and even if he is unable to supply his correspondent with any species he really wants, I think it is better to take what he has than to take nothing in return; for this, at any rate, stimulates him to further activity, with the hope of further exchanges. The only instance in which I would encourage free gifts is in the case of obscure and critical insects, and in such cases I have no doubt a correctly-named specimen is of the greatest value to a beginner, as it gives him help which he could not otherwise obtain. Are entomologists any the less ready to help those who are ignorant? I think not, if there is any real need for help. Has anyone ever had a doubtful insect that he was at a loss to identify, and has met with a refusal? I do not know what the experience of others may be, but for my part I have always found them most willing and ready to help in such matters, where help is really of service. But if there are still entomologists who long to help the novice, and are not satisfied with the above means, there is yet another way. Might not some body of men form a collection of British insects of all orders, correctly named and in good condition, and let them out, under specified regulations, to entomologists all over the country? I am sure that there must be many entomologists, experienced and inexperienced, living in distant parts of the kingdom, who would give a great deal to have the chance of seeing a well-authenticated series of any particular family or genus that they were working, and would regard such a collection as the greatest boon. I think there would be no difficulty whatever in getting such a collection together, for I feel sure that everyone would be only too willing to help with specimens for such a purpose.—T. D. A. COCKERELL; Bedford Park, Chiswick, March 3, 1885.

CAMBRIDGE ENTOMOLOGICAL SOCIETY.—The annual meeting of this society was held on February 7th. The number of members has been lately increasing, and now reaches twenty-four. There was a good attendance, and several interesting exhibits were shown. Mr. Bryan's five cases of Ceylon Lepidoptera led the way. The President, Mr. John Brown, showed two cases of British Coleoptera. Mr. Alfred Jones showed some fine series of *Cymatophora octogesima* (*ocularis*) and *Acronycta strigosa* taken at Cambridge in the past season. Mr. Wheeler kindly lent some examples of Norfolk fen-insects: among them were *Nonagria cannæ*, *N. brevilinea*, *Senta maritima* (*ulvæ*), varieties, and *Apamea ophiogramma*; also *Phorodesma smaragdaria*. The Hon. Sec., Mr. Cropper, exhibited *Bryophila par*, *Meliana flammea*, *Tapinostola hellmanni*, *Nonagria neurica* from this neighbourhood; also specimens of the latter from Lancashire, and a male of *Odonestis potatoria* of the normal colour of the female, bred from a cocoon taken at Wicken Fen. It was specially noticed, among the work done by members in the past year, that Messrs. J. Brown and A. Jones had been successful in taking the larvæ of *Bankia argentula* in the fens.—W. F. H. DFORD; Trinity College, Cambridge, February 23, 1885.

THE ENTOMOLOGIST.

Vol. XVIII.] MAY, 1885. [No. 264.

THE GENUS *SCOPARIA*.

By Charles A. Briggs.

The near approach of another season urges me to ask the assistance of lepidopterists towards extricating this genus from the confusion into which it has been allowed to fall. Highly interesting as the genus is, easy as the species are both to breed and to take in abundance in their particular localities, yet it seems to have always been looked upon as a genus to be avoided, and one difficult to master, as was the genus *Eupithecia*, before the labours of Harpur Crewe, of Gregson, Porritt, and others cleared away the difficulties by which that genus was surrounded.

This avoidance probably arose from three causes:—The first was a wide-spread error, traceable to a high authority, that *Scopariæ* would not bear pill-boxing, and should be killed, and even set, on the field, though how this was to be carried out in practice did not appear. This calumny, once spread, has clung to the group, although, as a matter of fact, the specimens, if kept fairly cool and quiet in a decent sized glass-topped box, are as well behaved as one could wish. The second cause is that everyone who has touched the group has tried to evince his earnestness and zeal by adding to the already over-laden list; and not only that, but if a new species was separated from an existing one, it was described independently, without clearly pointing out the characteristics that distinguished it. The third cause was that, as a rule, a new, or so-called new, species got placed in a different part of the genus from its nearest ally, thereby greatly increasing the difficulties attending the group. Thus in Mr. South's list *S. ingratella*, which is a mere variety of *S. dubitalis*, is absolutely separated from it by *S. conspicualis* and *S. murana*, the former of which ought clearly to come next to *S. ambigualis*, instead of being separated from that species by four others. In the same way, *S. atomalis* is placed between *angustea* and *gracilalis*, with neither of which has it any special affinity, even assuming that each of these species is entitled to specific distinction, which I am inclined to doubt. *S. truncicolella* is also widely separated from *S. basistrigalis*, which it more nearly resembles; while *S. ulmella* is crammed in between *mercurella* and *cratægella*, apparently in order to interpose a scientific frontier between two species so often mixed.

The only way in which this group can really be mastered is by independent working in different localities, followed by comparison of notes and specimens.

I am somewhat inclined to believe that future observation will show that *S. zelleri* (so far at all events as our English specimens are concerned), *S. atomalis*, *S. ingratella*, and *S. gracilalis* must all lose their claims to specific distinction; that *S. zelleri*, with its already defunct ally *S. scotica*, will be merged in *S. cembræ;* and *S. atomalis* in *S. ambigualis*. Apparently distinct as these two so-called species are, if extreme specimens only are contrasted, yet intermediate specimens of every possible degree of gradation are familiar to us all, and who can define the boundary-line where *ambigualis* ends and *atomalis* begins? So again, *S. ingratella* must sink as a mere pale form of *S. dubitalis*, common to chalky localities; while *S. gracilalis* will seek refuge under the name of *S. alpina*. Of *S. basistrigalis* I know but little; while *S. cratægella* and *S. mercurella* seem somehow to be strangely mixed.

Will entomologists in the coming season turn a little attention to this fine group in general, and to these six species in particular, so that we may see what species we really have? According to my misgivings it will resolve itself into:—

1. *S. cembræ.*
   b. var. *zelleri.*
   c. var. *scotica.*
2. *S. truncicolella.*
3. *S. basistrigalis.*
4. *S. ambigualis.*
   b. var. *atomalis.*
5. *S. conspicualis.*
6. *S. ulmella.*
7. *S. phæoleuca.*
8. *S. dubitalis.*
   b. var. *ingratella.*
9. *S. murana.*
10. *S. mercurella.*
11. *S. cratægella.*
12. *S. resinea.*
13. *S. lineola.*
14. *S. angustea.*
15. *S. alpina.*
   b. var. *gracilalis.*
16. *S. pallida.*

[illegible]

NINE DAYS AT RANNOCH.

By Arthur J. Rose and Oliver C. Goldthwaite.

The writers of this report came under the category of "enquirers," mentioned by Mr. Carrington last July, when an account of this hunting-ground was given in the 'Entomologist' (Entom. xvii. 145), and they take this opportunity of thanking our Editor for his kindness in giving so many useful hints.

We left King's Cross on Friday, 27th June last, by the mail train, bound for Struan, on the Highland Railway, distant about thirteen miles from Rannoch, or Kinlock Rannoch, as the place is termed in the maps. Finding, however, that we had waited too long at Perth on Saturday morning, and that the next train would not arrive at Struan in time to catch the post-cart to convey our luggage across country, we alighted at Pitlochrie, a few stations earlier, determining to walk through the beautiful Tummel Valley, past the Queen's View, to Rannoch, distance twenty-one miles.

This being an account of an entomological trip forbids our wandering into raptures over the really grand scenery through which the traveller passes on making this *détour*, but all entomologists fond of fine scenery, and strong enough for the walk, will consider this way of approaching Rannoch well worth the labour.

About two miles beyond the Bridge of Gany, as we were approaching the Tummel Valley, we came upon a beautiful glade of birches leading down to the river, which was foaming, splashing, and eddying against the rocks. Turning into this copse we immediately found *Lycæna astrarche* var. *artaxerxes*, a species new to both of us, and within two hours of our collecting in "bonnie Scotland." Although we had travelled all night, and had a long tramp before us, the temptation to remain here a little was too strong, and we were rewarded by taking between us a score of this pretty little butterfly, which we did not see again during our stay. On the road we beat out two *Cidaria silaceata*, and several special forms of *Cidaria immanata;* noticing also that *Tanagra atrata* (*chærophyllata*) was very plentiful among the bracken.

We arrived at Rannoch about 10.30, tired out, but very pleased with the prospect of hot fine weather. Sunday was devoted to visiting the kirk and a quiet stroll round; and on Monday morning we were up betimes, and after a good Scotch breakfast (porridge included), and a dip in the loch, wended our way to Innerhadden burn, by the side of which we ascended into Glen Sassun. After following the path for about a mile, we commenced wading through the heather, and here captured *Melanippe tristata*, *Larentia salicata*, a few *Melanthia ocellata* and *Eupithecia nanata;* and were glad to find a few *Cœnonympha typhon* (*davus*), which from their condition were evidently only just emerging. We found this butterfly preferred the damp hollows in the mountain sides; and our general experience was that where the heather was sprinkled with moss and sweet-gale, there you would take this species. One *Emmelesia minorata* (*ericetata*) was also taken flying over the heather; and of course our old friend *Anarta myrtilli* was to the fore, as usual.

We were informed very kindly by Mr. Thos. Eedle, among other things, that *Erebia epiphron* var. *cassiope* was to be sought further up the glen, and accordingly we made our way along the rough track till we reached a stone wall, which by knocking yielded two or three fresh *Coremia munitata*, and several *Larentia salicata*. A further tramp of two miles brought us to an old "bothy," and around here is said to be one habitat for *cassiope*. It is about a 2000 feet climb. A long search did not produce the desired effect, but by tapping the stones some very fine *Larentia salicata* were netted. In fact during the whole of our stay we found that several species which were faded in the lower land, could probably be taken in good condition by ascending another 1000 feet.

We returned after a hard day's work, had tea, and set out again to sugar along the shore of the loch. It was not dark till 11, so we had time for a rest and a little setting. The vegetation around the loch chiefly consists of alders and birches, with an undergrowth of bracken, wild rose, bramble, and honeysuckle; but, notwithstanding the encouraging prospect, not a thing came to sugar, and we only netted *Emmelesia adæquata* (*blandiata*), which was just emerging from pupæ. So we retired to bed at midnight, thoroughly satisfied, but very tired, with our first entomological experience in Scotland.

Tuesday, 1st July, was a fine warm day, and we again visited Glen Sassun. We spent a good part of our time tapping the rocks, along the edge of the burn, but only succeeded in capturing a small proportion of the insects thus dislodged. However, some beautiful forms of *C. munitata*, *L. salicata*, and *M. tristata* rewarded us; and by beating the birches, also alongside and over-hanging the burn, many fine varieties of *C. immanata* were obtained. Here we stayed to admire the wonderful peak of Schiehallion, towering grandly above the mountain range, and here and there tinged with snow; whilst at the head of Glen Sassun, near the summit of the range, a fine belt of snow, some half mile in extent, was glittering and sparkling in the sunshine. But we must push on, for it looks a good day for *E. cassiope*, and we are both greatly longing to add this species to our captures. But as we reach the desired neighbourhood the clouds gradually obscure the sun, which, however, shines intermittently, and prompts us to watch the long coarse grass upon which the larvæ feed. After passing an hour or so in this way we were compelled to give in, no *cassiope* appearing, and we returned home somewhat disappointed.

In the evening we returned to Innerhadden, and worked the meadows near the burn on the other side of the road, and found *Emmelesia albulata* in great plenty, but it was getting worn, and we did not obtain any varieties. *E. adæquata* also came to the net, together with a few fine *Melanthia occellata*, *Eupithecia nanata*, and *Hepialus velleda*.

July 2nd. We walked along the road, past the Altmore Falls, and climbed over the wall into some meadows, and by searching the rushes, for it was very dark, obtained some very fine specimens of *Lycæna icarus* (*alexis*), when we remembered reading in Newman's 'Butterflies' of the size and brightness of Rannoch specimens taken by Mr. Eedle many years ago. On pinning these specimens at home, great was our delight to find two decided varieties, the difference being that several black markings could distinctly be seen, just within the margin of the lower wings. Of course we revisited this locality, and then we took two more like specimens. It would be interesting to know if this variety is peculiar to Rannoch, or whether it has been taken in the South of England. In the afternoon we again visited Glen Sassun, where we captured two very dark forms of *Argynnis selene*, and two *E. cassiope*, by the side of a little mountain spring, but it was getting towards evening, and so we deferred climbing another thousand feet till the next day, July 3rd, which was gloriously fine, and to our great joy we induced *E. cassiope* to leave its hiding-place among the long grass. We spent the best part of the day here, for immediately the sun went in no *cassiope* were to be seen. We took about sixty specimens between us, all in magnificent condition; in fact we boxed some, because the wings were hardly dry. It is an easy insect to catch, but should you miss it, in a high wind, you will find considerable difficulty in getting a second chance. When the sun is out, however, it is very fond of disporting itself on the tops of the long grass, and in this position we captured several. A word of warning may be given here, if any of your readers are anxious to take *cassiope:* don't put off working for it while bright weather lasts; for although we visited this spot two or three times again, we never had another opportunity of taking it plentifully, only a few stragglers falling to our lot. Both on this day and the next we worked for *C. typhon*, which could not be termed plentiful, and some very fine female specimens, almost white at the outer margin, were obtained; the Scotch form differing very much from those taken at Witherslack the previous year.

The evenings were spent along the shores of the loch, but despite the strongest of rum and the best of sugar, not a single Noctua could be tempted to taste the feast. *E. adæquata* was literally swarming, getting on the wing by 7 o'clock, and a very nice series was obtained of this pretty insect, but scarcely anything else was to be seen.

July 4th. As we intended going to the Black Wood by the post-cart at mid-day, we spent the bulk of the morning in pinning and setting our captures, and taking a few more *L. icarus* in its old haunts, taking the precaution to book our seats on the post-cart first thing in the morning. There is a good road round the loch, along which an ordinary bicyclist or tricyclist would have no difficulty in travelling; this we mention for the benefit of those who would like to work this grand hunting-ground thoroughly, it being about eight miles from Kinloch, and it is very doubtful whether lodgings could be obtained in the neighbourhood.

The road to the Black Wood is fully described in last year's 'Entomologist' (Entom. xvii. 150), and the driver of the cart was quite able to tell us that "*alpina*" was to be taken at night; "on that crag, or among them birches up the burn," the Kentish glory is taken when the snow is knee-deep. Swarms of Geometræ flew out of the pines, dislodged partly by the wind, and partly ;by the vibration as we passed; and among others we thought we recognised by its superior size and peculiar slate-coloured appearance, the local variety of *Boarmia repandata.*

On alighting we commenced searching the boles of the pine trees, obtaining three varieties of the above; some magnificent forms of *Larentia cæsiata;* a few *Bupalus piniaria,* the pale patch in the centre of the wings being white instead of yellow, but the species was worn, and not worth taking; *Thera variata,* also worn; and, by carefully watching the bilberry, half a dozen *Halia brunneata* (*pinetaria*), just emerging. The afternoon was very windy, consequently we lost many an insect by being unable to chase it over the rough broken ground. We mothed all the way home in the dusk, obtaining, however, only *L. cæsiata, Coremia munitata, C. immanata,* and our old friend *E. adæquata.*

The next day we walked along the road past Tempar, and turning to the right crossed several walls, with Schiehallion right ahead of us. On one of these walls we took *E. minorata* in plenty, whilst *L. cæsiata* was a perfect pest. We also worked a very picturesque burn in this neighbourhood, but the result was much the same as at Innerhadden. In the evening a solitary specimen of *Dasydia obfuscata* was the only new capture; and an attempt by both of us at trout fishing proved futile. Another journey was made to the Black Wood, but it turned very stormy, and only by luck did we happen to obtain a few more *H. brunneata,* and one *Cidaria populata,* almost black.

On July 7th the weather completely broke up, and one of us stopping on for a few days longer gained nothing entomologically by the extended time. We were, however, thoroughly satisfied with the work done, which, by-the-bye, is very much harder than entomologising in the South of England; and only those who can stand a long tramp over rough mountainous country should entertain a visit to Rannoch. Our conviction is that the insects sold by dealers, who work the place, are thoroughly worth the price asked,—for example, imagos of *Pachnobia hyperborea* are chiefly to be obtained by spending the night on mountain crags enveloped in mist; this last condition being said to be essential to a "good" night.

We were fortunate enough to obtain comfortable lodgings in the village, which we can thoroughly recommend; and any other information we are possessed of will be willingly given by the writers.

11, Kyverdale Road, Stoke Newington;
2, Grove Villas, Grove Road, Walthamstow; April, 1885.

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

By Lyonell Fanshawe.

II.—KILLING AND PRESERVING.

Various methods are employed by collectors for killing beetles, and I will now enumerate some of the quickest and most effective ways. Undoubtedly the speediest, and, in most cases the best, plan is the following:—Immerse a piece of muslin in water absolutely boiling, and throw the insects upon it; an instant will suffice to deprive them entirely of life, and then they can be lifted out all at once and allowed to dry on a sheet of clean blotting-paper. A few, which would be affected by boiling water, may be killed and preserved in spirit, but it renders them rigid.

The "laurel-bottle," described in the previous paper, is a very favourite means of killing, the only drawback to this being that laurel has a tendency to stiffen the legs; this can be remedied by leaving the insects in the bottle for a day or two, when they will be found perfectly relaxed, or you may relax them at once by plunging into hot water. If left too long in the bottle the legs are very liable to come off altogether when being arranged. Dropping them into a box containing cotton-wool saturated with chloroform is another way. This is not a good plan, however, as many beetles become rigid or are extremely hard to kill, and, after having been set and even put away in the store-box, they have been found still alive. The next question is how to set. Moderate-sized beetles should be pinned with the entomological pins sold for the purpose; the pin should be thrust through the right elytron near the shoulder. Great care must be taken that all the pins are exactly upright when placed in the cabinet, as nothing looks worse than to see them slanting in all directions. In the case of a large insect like *Lucanus cervus*, it is advisable to make a small hole first with the point of a fine needle, or otherwise the very hard elytron will probably turn the point of the pin. Also, when passing the pin through the body, be careful that it does not force off one of the legs. The legs, antennæ, palpi, &c., are then drawn out into a natural position, and fixed with pins or braces.

The smaller beetles must always be set on stiff white card. If run through with a pin it is sure to carry off a leg or otherwise disfigure the body. If the collector expects to have plenty of time to spare during the year, he will find it a very good plan to set his beetles temporarily in batches of a dozen or more on a slip of stout card with a very little thick gum, then, when in town, or for other reasons unable to collect, the cards can be immersed in hot water for an instant, and the beetles conveyed, ready set, on to a piece of white card, on which the smallest drop of coaguline sufficient to hold them has been placed. By this means all scratches will be avoided on the card. Attached to each card should be a very small label, on which a number is written corresponding to a number in a book, giving date, locality, and any particulars worth remarking, or the number may be written at the bottom of the card. This doubtless entails a certain amount of extra trouble, but in the end it makes the collection much more valuable and interesting.

The first and most important consideration when setting a beetle is to give it plenty of card, and to set the limbs, antennæ, and all the organs of the mouth out thoroughly well. In many of the genera where the species are all small, and closely resemble one another, it is absolutely impossible to identify them unless the organs of the mouth and limbs can be minutely examined; but, besides this, nothing looks worse than to see a beetle crammed on to a tiny piece of card just large enough to hold it, with the legs tucked up all round, and the antennæ not showing at all. If too much card-space is given, some can be cut off afterwards, but if not enough, one cannot put more on.

It is the general rule not to put more than one beetle on each card, but some collectors prefer two or more. One in each series should be set on its back, so that the mouth and under surface may be examined more easily.

Some of the smaller Brachelytra will be found very difficult to set well, on account of the tendency the segments of the abdomen have of gradually contracting as the insect dries. The following is the Rev. J. G. Wood's method of preventing this:—"Fix the last segment of the body to the card with a little coaguline or diamond cement, which soon sets. Then, when it is sufficiently hardened, take the front part of the body in the forceps, and draw it gently forward until the segments of the abdomen have been pulled out to their proper extent. Then put a small drop of coaguline under the thorax, press it down with a card brace, and keep it down till dry." The length of the pin used for carding varies, of course, according to the collector's taste, and it does not much signify what the length may be, provided that every pin is of the same length.

The card should be pushed close up to the pin-head. In the cabinet all the cards must be pushed to precisely the same height in every drawer; if they are all at different heights, even though very slightly, it gives a very slovenly and untidy appearance.

We now come to the last, but nevertheless very important, consideration of how and where to store our captures. A cabinet is the receptacle most generally used for this purpose, and if a really good one is procured no better place could be found. A really good cabinet should be made throughout of old, well-seasoned, oak or mahogany, and will cost from fifteen shillings to a guinea per drawer. The British beetles will occupy about twenty-eight or thirty drawers. The only way of being certain of getting a genuine article is to go to a respectable maker and pay a fair price, but very good cabinets may often be picked up more cheaply second-hand at Stevens' Rooms in Covent Garden. The size of the drawer generally used is eighteen inches square, and each drawer must have "cells" round the sides to contain pieces of naphthaline. Clear of the cells the drawer should measure 16½ by 14¾ in.; the depth, exclusive of the cork, 1¼ in. It is imperative to have these cells always well stocked with preservatives, or else mites and numerous other horrors will enter, and damage in a few weeks the labour of years.

To the front of every drawer should be glued a small slip of card with the names of the families contained therein printed on, thus—I. Cicindela to Pterostichus; so that one can determine at once and without any trouble which drawer contains the insect required. It is better to place the cabinet a few inches away from the wall, to allow of air circulating, and care must be taken not to place it against an outside wall, lest possible damp warp the wood. If a cabinet is beyond the present means of the collector, store-boxes will do equally well, in fact they are preferred by many. These boxes can be purchased, covered with cloth, so as to resemble books.

The most recently published and best list of British Coleoptera is that by Revs. A. Matthews and W. W. Fowler (West, Newman & Co.) This can be bought printed on one side only, for labels. When commencing to arrange the drawers, the collector should, if possible, consult some standard cabinet in order to ascertain the amount of space to be left for each species. The number varies, but it is generally from nine to twelve. The lines should be ruled in with a fine, hard, sharp-pointed pencil, so that they may be easily erased at any time if necessary.

Between each genus a space may be left in case of a new member of that genus being discovered, which can thus be inserted in its proper position without disarranging the rest of the contents of the drawer.

2, Halkin Street West, Belgrave Square, London, S.W.

COLLECTING THE GENUS *EUPITHECIA.*

By John T. Carrington, F.L.S.

(Concluded from p. 112.)

No more pleasant early summer holiday can be spent than in searching for imagines of *Eupithecia pusillata.* These are to be disturbed from among spruce trees in the South of England in May. I have not taken this species far north, bnt it may be possibly found in many new places, simply because it has not been looked for. Those localities best known are Wickham Woods and Boxhill, or more correctly by the side of Headly Lane, where the spruces have grown large. The moths may be turned out of the branches with a stick, by gently agitating them, but are easily damaged, and soon begin to look somewhat seedy after a flight or two. They are, therefore, best bred; and the larvæ are to be beaten from the spruce about the first of July. It is far less trouble, however, to get eggs and rear a series through all their stages, and much more instructive. *E. exiguata* requires one to go to more cultivated spots, for its most common habitat is by the whitethorn hedgerows, which form the great charm of English rural scenery. Soon after the leaves are well out, in May and on into June, this moth may be taken flying on the sheltered side at dusk. The larvæ are to be beaten into an inverted umbrella in August and September; but again a batch of eggs are perhaps less trouble in the end, for they may be "sleeved" out in one's garden, and the little larvæ take care of themselves, but are better perhaps with earth for the pupæ to winter in. This may be arranged by tying a small flower-pot at the other end of the sleeve when the larvæ are getting full-fed; but do not forget to plug up the hole at the bottom of the pot, as worms or other "beasts" may get in, or the larvæ get out, if inclined to burrow too deeply.

As soon as the crab-apple flowers begin to show pink buds one may look for the larvæ of *E. rectangulata*. It also feeds commonly on the flowers of the cultivated varieties of apple. We breed, however, very different forms of moths from the crab-apple flowers, they being usually finer, brighter green in colour, and more regularly marked. I have seen moths bred and taken among apple trees in orchards which were almost uniformly black. The difference in colour and markings, clearly produced by the cultivated food, is very curious, and should be carefully investigated. It is only necessary to beat—gently, if in the orchard—the flowering branches over an umbrella to find the larvæ of this species, and the moths will be found in the neighbourhood of apple and crab-apple trees in June. A long series of *E. rectangulata* shows great variation.

One of the rarest, and at the same time most beautiful, members of the genus is another apple-feeding species. This is *E. consignata*, which appears to have its head-quarters in the apple orchards of the West of England. It may be found in May and June, sitting at rest on the trunks of the apple trees, and under the thicker branches. The larvæ feed in June and July upon flowers and leaves of apple, and are best reared from a batch of ova, for one can hardly expect the apple growers to allow us to beat the trees to the damage of the future fruit-crop.

Eupithecia coronata is one of the few double-brooded species of the genus. Early examples, lovely in their delicate green garb, until a wet night or two destroys this evanescent colour, may be found on palings or tree-trunks quite early in April and through May; while the second brood occurs in August. It is by no means a common species of the genus, although it occurs in many localities. The larvæ feed—the summer brood in July and August on clematis, and the autumn brood in August and September upon flowers of the hemp-agrimony and golden-rod. It is well worth rearing, as the bright colour of perfect specimens so soon disappears in a state of nature. The autumnal food may be kept in the bags already described; and having beaten a few flower-heads into an umbrella or beating-tray, and found a larvæ or two, it is unnecessary to look for more, but simply gather the food without shaking it too much, and trust to seeing these perfect little gems in due course next spring.

In June we must be up betimes in the morning, if we would like a good series of *E. fraxinata.* Our business will be to examine the trunks of ash trees between eight and nine o'clock in the morning. If the species is there, and we may expect it wherever ash grows in plenty, we shall find the moths just emerging from pupa, and drying their wings. The larvæ pupate among the crevices in the rough bark of the trees, where sharp eyes can find the pupæ in their silken cocoons. Otherwise this moth is difficult to get, for they soon leave the tree trunks as they dry their wings, and as the day advances. The larvæ may be beaten from ash in August, with occasional larvæ of *Eugonia fuscantaria;* but the moths are rarely seen when flying. *E. fraxinata* appears to prefer old well-grown trees.

Until the larvæ were accidentally discovered by Mr. Baker, late of Derby, *E. valerianata* was considered a rare species. It was then known as *E. viminata;* and one day Mr. Baker had thrashed some osiers long and valiantly, but to no purpose, thinking, as the name implied, the willow leaves were the food. Tired and disgusted he gathered a bunch of the common valerian, then in the full beauty of its delicate lavender flowers, to ornament his home. On looking them over for chance larvæ, nothing was to be seen; but later at night, on suddenly entering the darkened room where they had been placed in water, to his astonishment the whole bunch of flowers was alive with larvæ of this moth. So it is with many *Eupithecia* larvæ; it is waste of time to look for them; and it is best to carry home the food, and deal with them as described in the first portion of these remarks (Entom. xviii. 111), and trust to the moths appearing at the proper time.

In very different localities must we look for *E. constrictata* The moths are to be taken flying over dry banks, or chalk o limestone hill-sides, over the beds of wild thyme, in July an August. It is seldom to be taken in good condition, and it i not easy to rear, though possibly the larvæ might be induce to eat the flowers of garden varieties of thyme. I have take this species near Richmond, in Yorkshire; and commonly on th Hill of Howth, in Ireland. It is said also to occur in Scotland.

Among our most easily-obtained pugs, and one which is frequently most neglected in collections, is *E. subnotata.* This is a regular garden species, and is to be found where the common goose-foot (*Chenopodium*) abounds. It flies freely in June and July, from ten to twelve at night, flitting from one flower or seed-head of its food-plant to another; and may be found in fine condition, and often in plenty, where the goose-foot has been allowed to grow freely. Shaking the seed-heads over an inverted umbrella during August will generally produce the larvæ, if worked for at night. Another garden species is *E. assimilata*, which larvæ feed under the black currant leaves early in October. They also feed upon wild hops (*Humulus*), riddling the leaves with little holes, as though the plants had been shot at with pellets from a gun. We shall find, however, that the larvæ feeding on the hop leaves are very different from those feeding on the black currants, being much brighter in colour, often showing brilliant tints, such as pink and carmine, which varieties never appear on the currant bushes. There does not seem, however, to be much difference in the moths reared from these brilliantly-coloured larvæ. This moth is double-brooded, appearing in May and August.

A few specimens of *E. sobrinata* may be at times taken at the suburban lamps. These are to be traced to the cultivated varieties of juniper in the ornamental gardens. We must, however, search for the larvæ in May and June, or the moths in July, amongst the wild junipers, if we want a good series of this species, which appears to occur freely wherever juniper abounds. An *Eupithecia* has been taken most seasons in the neighbourhood of Dover; first by Mr. Samuel Stevens long years ago, and latterly by Mr. Sydney Webb and others. Whether this is an extreme form of *E. sobrinata*, or not, I cannot say. I believe the captors think otherwise, and will probably some time or other describe it under a less fantastic name than some of those which have latterly been proposed for moths. It was thought to be the *Eupithecia ultimaria* of Boisduval, but this is doubtful, although that name in consequence appears in our newest list.

As we wander through the woods in July we shall probably see a patch of that handsome flower, the foxglove (*Digitalis purpurea*). If we examine the lower flowers on a spike we shall probably find some of them with their mouths closed, as though by a spider spinning its web. If we open them we shall find a fat, stumpy *Eupithecia* larva in each. These are of *E. pulchellata*, and we had better gather a goodly number, for they are sadly infected, as a rule, by parasitic ichneumons. The very closely-allied *E. linariata* is found in the larval state commonly, feeding upon seeds and wasted flower-heads of common toadflax (*Linaria vulgaris*) somewhat later in the year. Neither are common in the imago state, and the latter is most easily reared by gathering a bagfull of flower-heads in August and September, and trusting to the moths appearing next season.

By hedgerows and road-sides the burnet-saxifrage (*Pimpinella saxafraga*) grows commonly. Amidst this in June we should find an occasional imago of *E. pimpinellata;* but it is better to beat for the larvæ, which in some seasons may be taken in fair numbers from the seed-heads, for they feed upon the unripe seed-umbels in September. This species is better for having a little turfy mould, in which to pupate. Continuing our search among the seeds of other *Umbelliferæ,* we must give great attention to those of the wood angelica (*Angelica sylvestris*), for on these we shall find two species, viz., *E. albipunctata* and *E. trisignata.* The larvæ are so different as to be separated at a glance, the former being studded with small white tubercles, and the latter sprinkled with bristly hairs. It is little use expecting to take a series of either of these moths, while enough larvæ may be taken of either in September, and even in October in late localities, to satisfy the wants of any reasonable collector.

In drier woods than those delighted in by the swamp-loving angelica, we must search the flowers of the golden-rod in August for larvæ of *E. expallidata*, which are also said to frequent the flowers of ragwort (*Senecio*). These are apparently not common anywhere; and it is usually considered one of the rarer members of the genus.

Perhaps the best sport of any, in collecting larvæ *Eupitheciæ*, is to be obtained by beating the flowers of ragwort into an inverted umbrella. This may be conducted at any time until the flowers have even turned to seed. The larvæ are often numerous, both as individuals and species. We may expect among the latter *E. oblongata* (*centaureata*), *E. virgaureata* (also from flowers of golden-rod), *E. absynthiata*, *E. castigata*, *E. vulgata*, and others. All these pupate in turfy mould, and should be kept exposed to all weathers in winter, but not in too damp a place.

Just before dark on evenings in July, when there is little wind, we shall find specimens of *E. succenturiata*, flying gently and gray looking in the twilight round clumps of mugwort (*Artemisia*). These are most suitable when growing on a shelterd bank, or on the lee side of a hedgerow. The larvæ are strictly nocturnal in their habits, and are said to hide by day under fallen leaves, &c, on the ground, only coming up to feed at night, when they may be beaten along with those of *E. absynthiata* in September. Very differcnt are the habits of the larvæ of the allied (at one time supposed to be a variety of the same) species, *E. subfulvata*. These feed on the leaves of yarrow (*Achillea millefolium*), and are to be found at the end of August at rest, in the daytime, lying along the midrib on the upper side of the leaf. After finding one or two, one immediately gets the knack, and soon bags enough for a long series, which is always worth rearing, and from many localities, as this is one of the most variable of our pugs.

Eupithecia scabiosata (*subumbrata*) is a carrot-flower feeder, and the larvæ should be looked for when the wild carrot is in full flower on salt-marshes, or by the sides of our large tidal rivers. It may be swept by the sweeping net, or beaten into an umbrella in numbers. Evening is the best time to get these larvæ, as they are more active then than by daylight. The moths may be netted in June, but only sparingly in number.

E. jasioneata, one of our more recent additions to the British list of these insects, has as yet only been taken in Devonshire and South of Ireland. If the blue flowers and seed-heads of *Jasione montana* (sheep's-bit) were gathered and bagged in September, we might reasonably expect to find it in most localities where the food-plant grows.

E. plumbeolata feeds upon cow-wheat (*Melampyrum*) flowers, from middle of July to middle of August, the moth appearing in May in copses and woods where the food-plant abounds. *E. pygmæata* is a somewhat rare species, occurring in all three sections of the United Kingdom. The larvæ feed upon petals and anthers of stitchwort (*Stellaria holostea*) in June, but in captivity it has eaten the petals and stamens of *Cerastium*. The imagines fly about the middle of May. *E. campanulata* is another woodland species, feeding in August and September on the flowers and unripe seeds of the nettle-leaved Canterbury bell (*Campanula trachelium*) in a state of nature, though in captivity it will eat the seed-heads of other species of that genus, the moths appearing in the following July, but of course only in localities where the food-plant occurs.

About the middle of May we must not forget to search or beat the flowers of maple for the larvæ of *E. subciliata*, which is a "good thing" among pugs; but if worked for would probably be found in many unexpected localities. We should rear the moths in August. Another of the rarer *Eupithecia* is *E. dodoneata*, which must be looked for in May and June in large oak woods. The larvæ may be beaten from oak, but are better reared from a brood of eggs, and should be fed on young and succulent leaves.

Eupithecia togata is unique among British pugs, for its manner in which the larvæ feed. These are to be found by examining in autumn the unripe cones of spruce trees. The indication that larvæ are there is to be found by the little groups of frass which hang to the sides of the cone. When found and gathered, the cones should be placed in some receptacle, so as to stand with the narrow point downwards over some turfy earth, for the larvæ to pupate in. This is considered a rare species, but I believe it will be found wherever spruce trees are common and sufficiently high to produce large cones. A good field-glass will be found useful in examining the cones at a distance, and save much uncomfortable climbing. The moths occur in June.

The larvæ of *E. debiliata* occur early in May, feeding upon the leaves of bilberry or whortleberry (*Vaccinium myrtillus*). It spins the leaves together and resides in this tent-like home, much like the larva of the genus *Hypsipites*. The moths are found in the localities where they have been found at rest, commonly upon tree trunks, &c., in June. It is a somewhat local species.

I have almost completed my task, but before doing so there are several remaining species of the genus which must be shortly considered, but about which little can be said. *E. pernotata* has been bred once only in England, and then by Mr. Machin, who took the larvæ from golden-rod. I am not aware that *E. egenaria* has ever been bred in this country. *E. extensaria* has only been taken two or three times near Hull, but if the *Artemisia* of the neighbourhood was worked it might be possibly found in the larval state. Of *E. innotata* I know only that larvæ are said to occur upon *Artemisia* at the same time as those of *E. succenturiata*. It is possible that some of these three species, excepting perhaps our Russian visitor, may in time disappear from our lists, and the best one can say about them is, that it would be satisfactory if they turned up in greater numbers.

It must not be thought that there are no more pugs to be found in Britain. Nothing is so likely, for there are several on the Continent, which are common enough there, that might be found in this country. So in conclusion, allow me to express the hope that some of those who may be induced by these remarks to work the genus *Eupithecia* should find not only all our British species, but even make an addition to our fauna.

Savage Club, London, W.C., April 24, 1885.

DESCRIPTION OF A NEW SPECIES OF *PIERINÆ* FROM THE MALAY PENINSULA.

By W. L. Distant.

Appias andersoni, *n. sp.*

Male.—Wings above creamy white; anterior wings with the apical area—from less than midway between end of cell and apex of wing and narrowing to outer angle—blackish; neuration more or less blackish; basal half of costal area more or less shaded with greenish; posterior wings with the outer margin blackish, the neuration more or less darkened. Anterior wings beneath creamy white, costal area and apex ochraceous with a greenish tinge, the last with three obscure paler subapical spots; upper and lower cellular margins broadly blackish, beyond cell the colour is blackish, neuration more or less blackish, the two upper median nervules darkest and connected near margin with a transverse black spot; outer margin pale blackish. Posterior wings beneath bright orange-yellow, the neuration blackish; apex of cell and two large elongate spots beyond cell pale sulphureous; apical and outer margins and a transverse fascia extending from discoidal nervule to about lower median nervule obscure olivaceous. Body above more or less concolorous with wings; abdomen beneath creamy white, thorax and legs more or less concolorous with wings.

Ex. wings, ♂, 54 millim.

Hab. Perak (Künstler).

This species belongs to the section of the genus which has been generically separated by Mr. Moore under the name of *Huphina;* it is allied to the Javan *A. nama,* Moore, and is contained in the fine collection of Perak butterflies belonging to Dr. Anderson, which has been placed in my hands for determination. *A. andersoni* will be figured in 'Rhopalocera Malayana.'

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Unusual Altitude for Melitæa aurina. — Referring to Mr. Sandford's note (Entom. xviii. 123) on *M. aurina* (*artemis*), my own case of discovering a locality for this species last season (as recorded vol. xvii., p. 82) is very similar. I found the insects over 1200 feet above the sea-level, on the summit of a mountain, the sides of which are thickly wooded, with occasional pieces of boggy ground on the slope, which doubtless accounted for the occurrence of this marsh-living species.—Martin J. Harding; Old Bank, Shrewsbury, April 14, 1885.

Late occurrence of Macroglossa stellatarum. (Entom. xvii. 273).—I remember noticing an example of this species flying about briskly on a winter's day,—it would be in December or January,—and other entomologists have seen it abroad during mild weather in the period of its hybernation. Like some of our butterflies of similar habit, it is occasionally tempted out by a gleam of sunshine. The spots it chooses for its hybernation do not appear to be ascertained, but I presume the fact is unquestionable. Newman says that we may come across one at a flower any time from January to December, but there is, I think, only one brood yearly, oviposition taking place in the spring. — J. R. S. CLIFFORD; Cambrian Grove, Gravesend, December 11, 1884.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—I quite concur with Mr. Tutt's remarks (Entom. xviii. 94) as to *Agrotis aquilina* and *A. obelisca* being only variant forms of one and the same species, of which *A. tritici* is the type. Some foreign entomologists believe that *A. nigricans* is also only a form of *tritici,* an opinion which at present I am not inclined to share. However, the genus *Agrotis* seems to have been a puzzle to most lepidopterists; and in the 'European Catalogue of Lepidoptera,' by Dr. Staudinger and M. Wocke (1871), it forms a stupendous genus, only divided by letters, and containing 172 species, many of which English lepidopterists would view as distinct genera. *A. strigula,* Thnb. (*porphyrea*), commences the genus, and then is included *subrosea,* which is given as a British species only (*Anglia olim*); then follow our familiar yellow-underwings, *ianthina* in the letter D, and one other species in the E group; besides *rubi, umbrosa, dahlii, brunnea, festiva, cinerea, segetum, exclamationis, corticea, puta, nigricans, tritici, obelisca, præcox, prasina* (*Aplecta herbida*), and *occulta* (*Aplecta occulta*), &c. By the above we see that he retains as good species, *tritici, nigricans,* and *obelisca,* but sinks *aquilina* as a synonym of *tritici.* In Ent. Mo. Mag., vol. xix., p. 278, Mr. Warren says:—"One summer, many years ago, I beat out of some ivy, which covered the wall of a garden in the town, a great variety of Noctuæ, and amongst them numerous specimens of *Agrotis nigricans, tritici,* and two each of *aquilina* and *obelisca.* I remember having been much surprised at the time at the occurrence of the last two species, the examples of which I still possess." Mr. Warren then proceeds to give a translation from the 'Jahrbücher des Nassauischen Vereins für Naturkunde,' xxxiii., xxxiv., 1880-1881, p. 87. This notice is too long to give in its entirety, but the following are some extracts, from which it appears that Dr. Adolf Rössler, the author of 'Die Schuppenflügler des Kgl. Regierungsbezirks Wiesbaden und ihre Entwicklungsgeschichte,' believes *tritici, aquilina, obelisca,* and *nigricans* to be one and the same species. "*A. tritici* is certainly the most variable of our Noctuæ in size, markings, and colour; nay, even the antennæ seem not to be quite the same in all examples. We had an opportunity of assuring ourselves on this point very completely. The devastation caused in vineyards on the frontiers of Moravia, recorded by Treitschke, in vol. x., pt. 2, p. 19, of Ochsenheimer's work, have been repeated in our neighbourhood, at Ockelheim, near Bingen, in the years 1871 and 1872, to such an extent that many individuals had their vineyards destroyed." * * * * "The larvæ lived exactly like earth-worms,—by day under ground, and by night only on the surface, in order to feed. Salad, and such-like succulent plants, are much more relished by them than the tenderest shoots of the vine. Dr. Pagenstecher reared a large number of the larvæ with the same results as myself. * * * * Among the large number of examples reared in the course of these broods, there were those figured by Hübner,—as *fumosa*, fig. 153; *aquilina*, 135; *obelisca*, 123; *fictilis*, 479 and 710; *unicolor*, 544; *erata*, 623; *carbonea*, 700; *praticola*, 567; *vitta* and *aquilina*, 533–35; *ruris*, 416; besides the following figured by Herrich-Schäffer,—*adumbrata*, 121; *rustica*, 495; *fumosa*, 526; *tritici*, 527 and 552; *obelisca*, 529 and 553. All were plentifully represented, and it could not but be that all belonged to one and the same species, united as they were by numerous intermediate forms." Like Mr. Tutt, I have seen all kinds of varieties on the sand-hills here. Moreover, I am sure the genus *Agrotis* is not the only genus in our Lepidoptera which wants careful revision; and, in my opinion, especially the genus *Zygæna*, F., of which the identity of some of the species will in time be proved, many of the species in our Catalogues now being extremely doubtful, and requiring a thoroughly scientific investigation.—C. G. HALL; 7, Beaconsfield Road, Deal, April 6, 1885.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—This is by no means a new question, for in January, 1842 (Entom. vol. i. p. 254), under the title of "Observations on Species and Varieties," Mr. W. Bentley discusses it at considerable length, and after describing the points of difference between *Agrotis nigricans*, *fumosa*, *ruris*, *dubia*, and *obelisca*, says, "The vast numbers of specimens I have examined, varying from dingy black to light red, with all intermediate grades of character, have convinced me that they all constitute but one inconstant species." In the same manner he groups *tritici*, *vitta*, *pupillata*, and *ocellina*. Mr. Bentley was just as near to the truth nearly half a century ago as we appear to be now.—JOHN. T. CARRINGTON; April, 1885.

PAIRING OF LEPIDOPTERA OF DIFFERENT GENERA.—Whilst out collecting on the night of March 25th, with two fellow-entomologists, I noted what seems to me an unusual occurrence:—On the trunk of a beech tree was the male of *Hybernia marginaria* (*progemmaria*) coupled with the female of *Tephrosia crepuscularia*, and at the same time there were no less than four *marginaria* (males) crawling round and over the pair. The female *crepuscularia* was a small specimen of that species.—T. B. JEFFERYS; Clevedon, March 26, 1885.

MIMÆSEOPTILUS SCABIODACTYLUS.—Mr. South, in describing the larva of *Mimæseoptilus* (Wall.) *scabiodactylus* (mihi), unwittingly no doubt leads us to think (Entom. xviii. 98) that this plume larva has a "dorsal stripe reddish pink (or rose-madder), most distinct on the 9th to 12th segments," when full-fed. May I say that larvæ of *M. scabiodactylus*, when full-fed, have no pink upon them, or only so little that I have failed to see it? The larvæ from Folkestone, which "fed upon scabious," may possibly be *scabiodactylus*, but if they are like mine in the larva state then they certainly are not the same species as he calls *plagiodactylus*, because, as he quotes me on the same page, *plagiodactylus* (Stainton and Millière) has a broad, distinctly defined and distinctly pronounced rich claret-coloured dorsal stripe through all its larval life, and feeds upon the devil's-bit scabious (*Scabiosa succisa*) in this country, eating into the central unopened leaves, when young, in May, and afterwards eating the radical leaves. The second brood feeds upon the leaves in August, and appears in September and on into October, whilst *scabiodactylus* feeds upon *Scabiosa columbaria* in March and April, and is on the wing in June and July; but as yet I never knew a second brood of it. When young the larva is hirsute; the dorsal region is suffused with lightish pink, as seen through the rather dense hairs. Each change of skin reduces the colour of the pink streak, until, as I said before, the larva has no pink upon it when full-fed, whilst the larva of *plagiodactylus* of Stainton retains its broad dorsal claret-coloured stripe to the moment of pupation. This will be seen in the figure of it in

Millière's 'Iconograph of New and Little-known Lepidoptera,' but Mr. South, on page 99, absolutely describes *plagiodactylus* larva taken by himself in July, when, so far as I know the habits of *scabiodactylus*, no larva of the species could be in existence at that time. In proof of how little was known until recently of the life-history of this plume, and that even now we do not know much, I may say that Zeller, in 1841, called Haworth's *bipunctidactyla*, *serotinus;* and a variety of it he called *mictodactylus*. Then Stainton called it *plagiodactylus* in his Supplementary 'Catalogue' and in his 'Manual,' as did Millière; and again, Zeller christened it *aridus*, 1847 - 50. And now our good friend Mr. South says I have christened it *scabiodactylus*. That is not so; I have differentiated the larvæ of both species, and figured them, finding *scabiodactylus* is not any of the above, but a most distinct species, nearly allied to *pelidnodactylus*, Zell., but not so large as that species. Then Mr. South tells us that his series of *gonodactylus*, Sta., varies very much. May not some of these be *P. farfara*, Zell., a smaller, redder, and darker species than Mr. South's *gonodactylus*, and more like *zetterstedti* in colour and marking? We have a coltsfoot-feeding larva in Wales, in June, which makes a gallery through the fluff on the underside of the leaf. Can this be the larva of *P. farfara*, Zell.?—C. S. Gregson; Liverpool, April, 1885.

Attractions for Lepidoptera.—The following extract from the 'Bulletin' of the Brooklyn Entomological Society for December, 1844 (vol. vii., p. 105), may be of interest to some readers of the 'Entomologist:'—"Dr. Holland stated that the burning gas-well near Pittsburgh illumined the country for miles around, and insects were attracted by the thousands, so that a circle of scorched insects was each morning to be found. Among them were many large Bombycidæ, principally males. Over 100 male *Saturnia io* were found one morning. He fears this may eventually cause the destruction of the larger Bombycidæ in that vicinity. The larva of *io*, else common enough, is this season extremely rare. At an electric light a large number of very good species had been taken. Mr. Græf related the experience of some collectors, who threw a powerful light against a white sheet, giving a large white surface, which proved very attractive. Mr. Smith related his practice in the Catskills, pulling down a thin white blind to an open window, and setting a lamp behind it. The insects flew to the white surface, found their way into the room around the edges, and quietly settled about the walls, where they were taken next morning. Mr. Schwensen had often noted the attraction of an electric light, near the Central Park, to Coleoptera. Carabidæ, and especially *Harpalini*, came in considerable numbers. Dytiscidæ and Hydrophilidæ only when the wind was favourable, *i.e.*, from the Park lakes. The attraction of sugar to insects was then brought up, and Mr. Claggis, who had collected during the past season in the Isle of Jamaica, gave the result of his experience. Sugaring trees was without result. The flowers exercised a superior attraction. Flowers were so abundant that collecting at them was tedious, so he tried sugaring flowers, with complete success. The flowers artificially sweetened swarmed with insects, while the others were deserted. Large Bombycidæ came to this bait that never came to sugar on trees."—W. W. Fowler; Lincoln, April 15, 1885.

Myelois ceratoniæ.—At Christmas time I found a larva feeding in sweet almonds, which on March 18th produced a fine specimen of the above species.—Geo. Coverdle; 24, Fleming Road, Lorrimore Square, E.C., April 24.

Ichneumons Bred, other than from Lepidoptera.—*Hemiteles castaneus*, Tasch., 13th April, 1882, from *Trichiosoma betuleti* (sawfly cocoon). *Orthopelma luteolator*, Gr., 30th May, 1882, from *Aulax hieracii* gall, on *Hieracium umbellatum* (narrow-leaved hawkweed); and 11th June, 1884, from *Rhodites rosæ*, rose Bedeguar. *Hemimachus instabilis*, Först., 23rd August, 1882, from *Cionus scrophulariæ* (pupa of the beetle). *Limneria curvicauda*, Holmgr., 11th October, 1884, from *Nematus gallicola*, sawfly galls, on *Salix viminalis*, gathered 25th August. *Euryproctus nigriceps*, Gr., 11th June, 1881, from *Trichiosoma betuleti* cocoon. *Mesoleius sanguinicollis*, Gr., 10th September, 1884, from galls on *Salix caprea*. *Pimpla brevicornis*, Gr., from pupa of a beetle. *Bracon lævigatus*, Ratz., 26th August, 1884, from *Nematus gallicola* galls on *Salix viminalis*.—G. C. Bignell; Stonehouse, Plymouth, March 14, 1885.

Errata.—Entom. vol. xviii. p. 89, line 1, for *Sphinx cassinea* read *Asteroscopus sphinx* (*cassinea*); p. 95, line 7, for *Gnopha* read *Gnophos*; and p. 123, line 7 from bottom of page, for *Procris ino* read *Ino statices*.

THE ENTOMOLOGIST.

VOL. XVIII.] JUNE, 1885. [No. 265.

LIFE-HISTORY OF *LIOTHULA OMNIVORA*.

By George Vernon Hudson.

The larva of this moth may be found throughout the year on the foliage of various trees, the favourite among the indigenous kinds being the common manuka (*Leptospermum*). In cultivated parts of the country, where a great many of the coniferous pines (*Cupressus macrocarpus*, *Pinus insignis*, &c.) have been introduced, it is to be found feeding on these quite as freely as on its original food-plant; it also shows great partiality for willows. When very young, and probably immediately after leaving the egg, this larva constructs a wide spindle-shaped case, principally composed of silk, only a few small fragments of leaves, &c., being attached to its outside; it has a large aperture in front, through which the head and anterior portion of the larva are projected, and a much smaller one at the posterior extremity, which allows the pellets of excrement to fall out of the case as they are evacuated. The enclosed caterpillar is of a light straw-colour, the head and first three segments being dark brown and hardened, with their anterior margins shining white; legs brown. The abdominal segments are considerably thickened near the middle of the insect, rudimentary prolegs being present on the 3rd, 4th, 5th, and 6th segments of the abdomen. The anal prolegs are very strong, and are furnished with numerous sharp hooklets, which retain the larva very firmly in its case. As it grows it increases the length of its domicile from the anterior, and causing it gradually to assume a more tubular form, tapering towards the posterior aperture, which is enlarged from time to time. The outside is covered with numerous fragmentary leaves and twigs of various sizes placed longitudinally on the case, and frequently there are green pieces near the anterior aperture, which the larva has recently selected and joined on. The interior is lined with soft smooth silk of a light brown colour, the thickness of the whole fabric being about the same as that of an ordinary kid-glove, and so strong that it is impossible to tear it, or indeed to cut it, except with sharp instruments. The size of the case when the caterpillar is mature varies considerably, ranging from twenty-five to thirty lines or more in length, and about three in diameter, the widest portion being a little behind the anterior aperture.

During the day the larva spins a loop of very strong silk over a twig, the ends being joined to the upper edges of the case on each side; in this way it hangs suspended, the caterpillar lying snugly within. I have often known a larva to remain thus for over three weeks without moving, and afterwards resume feeding as before; this probably occurs while the inmate is engaged in changing his skin, the cast-skin being most likely ejected through the posterior aperture of the case.

At night the larvæ may be seen busily engaged: they project the head and first four segments of the body beyond the case, and walk about with considerable rapidity, often lowering themselves by means of silken threads; the only locomotive organs are of course their strong thoracic legs, which appear to easily fulfil their double function of moving both larva and case. If disturbed these insects at once retreat into their cases, closing the anterior aperture with a silken cord, which is kept in readiness for the purpose, and pulled from the inside by the retreating larva. This operation is most rapidly performed, as the upper edges of the case are flexible, and thus fold closely together, completely obstructing the entrance.

From the case I will now turn to the description of its inhabitant. The chief peculiarities of the young larvæ have been noted above; what follows consequently refers to the full-grown caterpillar. The head is moderate in size, of a light yellowish colour, covered with a number of minute black specks; the first three segments are white, very smooth and shining, with a dark brown dorsal line and a large lunate spot, similar in colour, on the posterior margin of each at the side; there are also numerous small blackish dots, which become denser on the ventral surface; the legs are dark brown, and very robust. The abdominal segments are smaller than the preceding; the first dull brick-red in colour, with an obscure brownish band in the centre; the rest are of a uniform dull brown hue, almost black, they are much wrinkled, especially on the under surface; prolegs situated as in the young larva, but much smaller in proportion. Length from thirteen to twenty lines.

The individual I extracted in order to make the above description evinced an intense dislike to the operation, retreating to the extreme end of his case, and clinging firmly with his anal legs; when, however, the whole of one side was cut out he was forced to give up possession, and a more helpless insect than the naked larva can hardly be imagined. As soon as I had finished with him I put him back in his old case, which he completely repaired in a few days, the new material with which the larva had filled in the slit down the side being plainly visible, leaving a curiously mended appearance.

These larvæ can endure long periods of starvation. I once found a specimen which had been left in a box for four months without food, having been forgotten. It was very small and shrivelled, bnt still alive, although I think it subsequently expired.

When full-fed this caterpillar fastens the upper end of its case to a branch with a loop of strong silk, which is drawn very tight, preventing the case from swinging when the plant is moved by the wind, and also rendering the insect's habitation more inconspicuous by causing it to resemble a broken twig. The anterior aperture is completely closed, the loose edges being drawn together and fastened like a bag. The posterior end of the case is twisted up for some little distance above the extremity, thus completely closing the opening there situated. It is lined inside with a layer of very soft silk, spun loosely over the sides, and partly filling up each end. In the centre of this the pupa lies with its head towards the lower portion of the case, the old larval skin being thrust backwards amongst the loose silk above the chrysalis.

In this stage of existence the extraordinary sexual disparities which are so characteristic of the family manifest themselves, the male and female pupæ being very widely different in all respects. The male pupa is elongate and somewhat attenuated, especially in the abdomen; the head and eyes are moderately large, the antennæ-, leg-, and wing-cases being very conspicuous. The thorax is broad and well developed, and the abdomen tapers slightly towards the apex; it has seven visible segments, the last being flattened dorsally, and provided with a small sharp spine on the ventral surface close to the extremity. In colour the pupa is dark chestnut-brown, inclining to black on the head and wing-cases; the posterior margins of the abdominal segments are black, the terminal ones being lighter than the rest; there are also a few obscure yellowish spots on the breast of the pupa. The edges of the posterior articulations are furnished with a double row of very fine but stiff bristles on the dorsal surface. Length about seven lines. The female pupa is much larger and cylindrical in shape, the abdomen occupying nearly the whole of the body; it possesses nine visible segments, the terminal one being obtusely conical. The head and thorax are very rudimental, more resembling those of the larva than the male, all the appendages being, however, reduced to hardly visible warts. In colour it is pitchy black and shining, the head and thorax being obscurely cinereous, and the two terminal divisions of the abdomen ruddy yellow; the edges of all the segments on the dorsal surface are slightly dentate. Length about ten lines.

This insect remains in the pupa state during the summer months, *viz.*, from May till September. When about to emerge, the male chrysalis works his way down to the end of the case, forcing open the old aperture there, and projecting the head, thorax, and upper portion of the abdomen, the pupa being secured from falling by the spines on its posterior segments, which retain a firm hold in the silk. The anterior portion then ruptures, and the moth makes its escape, clinging to the outside of its old habitation and drying its wings. It is probable that the female insect does not leave her case, communication with the male being no doubt effected through one of the orifices, and the eggs afterwards deposited inside.* On one occasion I found a case full of eggs, containing the shrivelled body of the female and her old pupa-shell, which would seem to confirm the above opinion. In colour the male is of a uniform blackish brown, becoming darker on the body, and lighter near the middle of the front wings, each of which has an obscure rusty brown spot near its hind margin; all are very sparsely covered with scales, the posterior pair being semitransparent. The antennæ are heavily bipectinate at their bases, becoming quite simple at the tips. The expansion of the wings is eight lines.

---

* For details of copulation and figures of genitalia in the allied American bag- or basket-worm (*Thyridopteryx ephemeræformis*, Haw.), see Riley's description in *Sci. Am., Suppl.*, April 3rd, 1878, and Proc. Bi. Soc. Washington, ii., pp. 80-83.—E. A. F.

The female has a great superficial resemblance to a large maggot; the head and thorax are very small, the legs being extremely minute, and much resembling those of the larva in structure; they are of no use in walking, the insect being incapable of locomotion, or indeed movement of any kind, except a slight twirling of the ovipositor, which takes place when the eggs are being laid. The antennæ are in the form of two minute papillæ, apparently without articulations, projecting from each side of the head. The abdomen is very large, and the divisions are somewhat obscurely indicated; at its extremity it is furnished with a slender two-jointed ovipositor, the basal joint being twice the width of the terminal one; above this is situated a thin tuft of straw-coloured scales, and there are also a few scattered ones of the same colour on the anterior portion of the insect and about the legs. Colour uniform dull yellow, the head and prothorax slightly corneous and dark brown. Length ten lines. This creature is of such a soft consistency that it becomes quite flat when placed on a hard level surface, which offers it no support.

Of the habits of the imago in its natural state I am quite ignorant, as all the specimens I have ever seen were reared in captivity from cases containing either larvæ or pupæ; and as its discoverer, Mr. Fereday, of Christchurch, obtained all his examples in the same way, it would appear to be very rarely met with in the open.

Notwithstanding the strong case that protects this insect during its preparatory stages it is very susceptible to the attacks of dipterous parasites; in fact it is so frequently infested that I am sure quite three out of four of all the cases I have opened have contained dipterous pupæ. The numbers found in each individual vary considerably; generally there are about six, but as many as fourteen or fifteen frequently occur in very large caterpillars, while the much smaller larvæ of the males sometimes contain but a single parasite. These pupæ are dark chestnut-brown in colour, with distinct articulations; their length is nearly three lines, and they are of the ordinary coarctate form. The perfect insect is a brilliant green fly, the abdomen being almost blue; the scutellum is bordered with fulvous, and the legs are black; the whole insect is also covered with numerous black bristles; its length is about three lines. A description of this fly may be found in the 'Catalogue of New Zealand Diptera,' where it is described for the first time under the name of *Eurigaster marginatus*.

Among a large number of the exuviæ of this species I found one which had not emerged. Knowing that all the individuals of a single brood of dipterous insects always appear within a few hours of one another, I was anxious to ascertain what had occasioned the protracted emergence of this specimen, and in order to do so I enclosed it in a small tightly-fitting box. On examination about ten days afterwards I discovered eighteen small Chalcids had escaped through a small round hole near its anterior end; four of these are considerably smaller than the rest, but do not differ in any other respects, and are no doubt males.

Owing to my very imperfect knowledge of the New Zealand Hymenoptera, I think it would be useless for me to attempt to describe an obscure species of this kind at present. I therefore enclose specimens, should they at any time be required, and leave the description to someone who is better able to perform the task than myself.*

I have not yet been able to ascertain how the Chalcid introduces its eggs into the Dipteron; nor is it likely to be discovered, except by the most minute observation. It is certain that a full-grown maggot would not suffice to nourish eighteen Chalcid larvæ, which collectively equal it in bulk after it had ceased feeding; hence it is evident that the eggs are not deposited in the dipterous larva when it has left the caterpillar. If, on the contrary, they are introduced into the maggot while it is within the *Liothula* larva, the hyperparasite must either promiscuously deposit in every caterpillar it comes across all the eggs, except those which reach a dipterous maggot never hatching, or it must by some extraordinary means be able to single out those caterpillars infested by Diptera and oviposit in them, occasionally perhaps missing the maggots lying within, as Mr. Bignell conjectures in the case of *Abraxas grossulariata* (Entom. xiii. 245). Both of these suppositions are, in my mind, contradicted by the fact that out of six dipterous pupæ taken from a single caterpillar only one was infested with Chalcids, and that contained eighteen. Now it would be a remarkable circumstance indeed for a female Chalcid to oviposit in a caterpillar eighteen times, striking an enclosed maggot every time, and not any of the five others once. I prefer to consider, until actual observation proves it fallacious, that both *Eurigaster* and the Chalcid enter the *Liothula's* case together by the posterior aperture, the latter possibly clinging to the former. The Dipteron then lays a number of eggs on the skin of the caterpillar, as is the case with all parasites of the order, and the hyperparasite oviposits in one, or perhaps occasionally more, of these; the dipterous maggots then eat their way into the caterpillar, both insects afterwards developing, as we have seen above.*

---

* Two specimens of this *Pteromalus*, and a third partially destroyed, are deposited in the British Museum.—E. A. B.

This theory may of course be upset at any time by the discovery of the actual method; but, with the facts at present at my disposal, I think the above is the most feasible explanation, and, moreover, that it is not without a parallel in the insect world anyone will admit, who is acquainted with the life-history of the genus *Sitaris* among the Coleoptera.

Karori, Wellington, New Zealand, March 25, 1885.

---

* Sir Sidney Saunders met with a similar difficulty in the case of a *Chalcis* hyperparasitic on a *Sarcophaga* living within the body of a locust (*Œdipoda cruciata*, Charp.). He says, "Hence the question arises, how the parent *Chalcis* obtained access to the *Sarcophaga* larvæ for the purpose of depositing her eggs? It might be supposed that this opportunity was afforded at the time when the adult larva quits the body of the locust to undergo its final metamorphoses in the earth. But such could not have been the case in this instance, when the transition took place within a closed box remote from their accustomed haunts. The egg must therefore have been deposited at an antecedent period, either while the larva was within the body of the locust, or probably still earlier, when the newly-hatched larva was about to penetrate into the body of the locust." (Proc. Ent. Soc. Lond., 1881, p. xxv.)

FRUIT *versus* SUGAR.

By George Barnard.

It may serve to amuse some of your readers to know how we catch moths on this side of the world, using fruit instead of sugaring; so I will give a slight sketch of our proceedings towards the end of January, 1885. We had had heavy rains and hot steaming days, all vegetation was running a mad race, and such fruit as we can grow here was ripening apace. With the hot steaming days came innumerable butterflies,—for years past there has been nothing like it, the Whites and Yellow, *Catopsilia*, *Pieris*, and *Terias* being most prominent.

Seeing such a profusion of Rhopalocera made one suspect that moths might be equally numerous, so we began our traps in this way. Having gathered half a dozen ripe bananas, we hung them in separate places about the garden. About half an hour after dark we began our rounds, lantern (bulls'-eye) in hand. The first we came to had one large moth, *Ophideres fullonica*, hanging to it, but, as it was not a good specimen, it was allowed to remain. On the others were sometimes two and even three. The best were selected and captured in this way:—A large prune-bottle, charged with cyanide of potassium, was quietly held under the moth, and, if the fumes were not sufficiently powerful to cause the insect to drop, the cork was brought down and the moth forced into the bottle; after a few moments it was taken out and pricked with oxalic acid (for which hint I am indebted to the 'Insect Hunter's Companion.') And so we went on, getting another species or so occasionally, notably *O. imperator;* but the first few evenings being dry and comparatively cool and windy moths did not put in a numerous appearance. But then came a change. A slight rain came on for the next three days, the evenings being misty and warm. At night moths became as numerous as butterflies by day; and our enthusiasm was excited to the highest pitch, for on each banana three, four, and even six, grand moths were hanging, jostling each other to get at the juice, and on some figs just ripening and burst with the wet were countless moths, a sight to be remembered; they were actually in clusters, and of many species. Besides those mentioned above were *O. materna* and O. salaminea, two species of *Hulodes*, and other large Noctuids measuring from two to three inches across the wings, of the names of which I am quite ignorant,—probably some are new,—and a host of smaller ones, amongst which the most conspicuous was *Homoptera ustipennis.* A peculiarity about this moth is that out of twenty specimens no two may be alike. It was a puzzle which to take, they all seemed so good; however, my sons worked away at them till late at night, and at last had to desist from sheer want of room; every available box being filled, much to our disgust, as we were so greedy, it being a disappointment to see the moths and not be able to preserve them. However, we set by a good series, for it is not often such a grand display of insect-life occurs here.

The strange fact of all this is that it happens after a severe drought of two successive seasons, wherein insect-life was scarcely seen, and trees and shrubs in many places had died out. Did the few survivors breed quickly and numerously after the first rains in November, the surroundings being favourable to a quick growth? I consider the smaller moths were attracted to the juice oozing from the figs, &c., and that the *Ophideres* have the power of piercing the rind of any of the ordinary fruits, as they are often seen on oranges, and the fruit-growers of Rockhampton loudly proclaim against them. The chief mischief to oranges is caused by a small fly, which pierces the rind with its ovipositor and deposits its eggs. The maggots feed to the interior, when the orange drops off. As a trial I hung up a nearly-ripe banana, and, after watching the moths for some time, took it down, when three or four small punctures were easily seen, the juice already beginning to ooze from them.

Such was our collecting in a few evenings in January. We have always considered March the very best month for Lepidoptera, the last brood being then out; so perhaps we shall have to use the cyanide bottle again, it may be with equal effect. I have tried sugaring, but, beyond drawing multitudes of ants and some other noxious beasts, nothing came to it.

Coomooboolaroo, Duaringa, Rockhampton, Queensland, Feb. 23, 1885.

CONTRIBUTION TO THE LIFE-HISTORY OF *TRIGONOPHORA FLAMMEA.*

By Francis C. Woodbridge.

In October of last year I was fortunate enough to obtain a batch of eggs of *Trigonophora flammea* (*empyrea*), and although I have to record a failure this time, perhaps some of your entomological readers may nevertheless be interested in knowing my experiences as far as they go.

The ova were deposited about the middle of October, and were of a conical shape flattened at the base; the ground colour was buff, and they had a dark-brown spot at the apex and a ring of the same hue running around them half-way between the apex and the base. Shortly before hatching out, which happened on the 8th, 9th, and 10th December, the ova changed colour and became grey all over.

Though I supplied the young larvæ with food of various descriptions, they seemed to prefer the *Ranunculus bulbosus*, and in fact would touch nothing else. When the young larvæ first emerge from the ova they are of a dark shade of green and hairy, or rather, I should say, fluffy. When disturbed they suspend themselves on silken threads from the leaves on which they happen to be feeding. They were about one sixteenth of an inch in length, and the prolegs, not being perfect, humped up somewhat after the style of a Geometer when moving about.

On the 20th December the larvæ had passed their first moult, and were about a quarter of an inch in length, and of a shining dark green, but they had lost their fluffy appearance, being covered with short hairs, and were more or less speckled with black.

Here, however, my first misfortune overtook me, for having neglected when changing their food to insert a piece of paper between the top of the jam-pot, which formed their abode, and the glass which covered it, all the larvæ but three during the night effected their escape.

On the 1st February the three survivors again moulted, and appeared in a bright green costume with a whitish longitudinal stripe on each side, running along just beneath the spiracles, the ground colour being of lighter shade below these lines, and the head and legs being of a faint brown. The larvæ were still covered with fine short hairs, and appeared to have all their prolegs perfect. When disturbed they roll up in a ring and fall from the leaves. Having ascertained that their food-plant was *Ranunculus ficaria*, I supplied them with this, but they seemed at first to prefer *R. bulbosus*, though eventually they became used to *R. ficaria*, and then would not eat *bulbosus*.

There was probably a moult between the 20th December and 1st February, but as I was away from Lewes between those dates I had no opportunity of watching the larvæ.

On the 19th February the larvæ were again moulting, and on the 1st March were still of a green colour, though darker than before their moult, with five whitish longitudinal lines, one being along the centre of the back (dorsal), one on each side beneath the spiracles, and the remaining two (sub-dorsal) on each side, half-way between the dorsal line and the spiracles. There were also two white spots on each side of every segment except the head and second segment, situate between the dorsal and sub-dorsal lines. The hairs had almost disappeared, but could still be seen if the larvæ were held up to the light.

The next moult took place between the 18th and 28th March, the larvæ afterwards being of a dingy green, with numerous white speckles and spots, the most conspicuous being the two before mentioned, and a white one behind each spiracle. The whitish hues had given place to dull green ones, those on each side below the spiracles being the most distinct and lighter than the others.

There are also numerous indistinct wavy lateral lines of various shades of green covering the larvæ, but they are scarcely visible.

The larvæ moulted again between the 3rd and 14th of April, and after this moult their general appearance is brown, with a green tinge. There is a darker brown diamond-shaped mark on the fifth and following segments, stretching across the back of the larva. The head is brown, and the second segment is brown, with two dark-brown rectangular marks, with two white spots on each, the marks being divided by a short whitish streak. The third and fourth segments have a line of four white dots circling over them, whilst the remaining segments have four white spots, one being on each side about the middle of the segment at the lowest angles of the diamond-shaped marks, and one on each side of the diamond-shaped marks half-way between the before mentioned spots and the angle nearest the head. There are also two parallel rows of white spots on each side of the larva, one in the same line with the spiracles, and the other a little above. A darker band of brown runs along the back. The ground colour is greenish brown, beautifully marked and marbled, above the spiracles, with numerous dark brown or black wavy lines. The legs and underneath parts of the larvæ are of a pale pea-green without markings.

Feeding only took place at night after the third moult, the larvæ hiding themselves during the day at the bottom of the jar in which they were kept.

After the moult in April, as the larvæ did not seem to care much about either *R. bulbosus* or *R. ficaria*, I gave them some privet, which was just then coming into leaf, and which grew abundantly in the locality where the imago is found. They immediately commenced feeding on this, and were nearly two inches in length, and I should say almost full grown, when a lady visitor, impelled no doubt by the proverbial curiosity of the sex, proved fatal to two of them, thus leaving me one survivor only. This survivor I put in a tin box with some earth at the bottom, and on the 1st May it disappeared. Of course I thought the larvæ had burrowed, but on searching the mould a few days later I could not find it. Whether female curiosity was also to blame I do not know. The larvæ in the various stages afforded rather a striking example of imitation of the plants on which they fed. In its green forms, its general ground colour, with the white spots and lines, it gives a good resemblance to the leaves o the pilewort, the white spots giving it the appearance produced by the reflection of the sun's light on the shining surface of the leaves, and the brown colour of the larvæ after its last moult giving a good imitation of the stems of the privet. I may add that my larvæ after their third moult were kept in a greenhouse, though without any artificial heat. The larvæ will also feed on ash.

[illegible]

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Chœrocampa celerio at Berkley.—In November last a young man brought me a specimen of *Chœrocampa celerio*, which he said he had found on the pavement in this town one evening, just as it was getting dark. Is not this a late occurrence for this rare and handsome species? — James Borer; High Street, Berkley, May 19, 1885.

Note on certain Agrotidæ.—In reply to Mr. Tutt's question (Entom. xviii. 94) relative to the identity of *Agrotis tritici*, *A. aquilina*, and *A. obelisca*, as an old entomologist who knows the larvæ of these three species, I can say, for the information of any who do not, that they cannot well be mistaken for one another. Thus *A. tritici* larva is about an inch and a quarter long, cylindrical, with the ends reduced, dirty, colourless, grub-like, slightly glaucous, with hardly any markings; when just changed is dirty glass-like; it can always be found upon our sandy coast lands, wherever *Cerastium* grows, buried at the roots, in May. *A. aquilina* larva is an inch and a half long, cylindrical, slightly reduced at second and last segments; this is more striped than are the larvæ of the genus *Agrotis* generally; sometimes these stripes are very faint on the dorsal region; the broadest stripe is on the side, below which is another broad stripe, dark, dirty greenish above the spiracles. *A. obelisca* is fully an inch and a half long, thickly cylindrical, having a broad dorsal streak of rich purplish brown, almost covering the back when seen from above. I took and bred upwards of fifty when last in Ireland; they are very fine, well-marked specimens. I got them by clearing all the vegetation and soil off the whole face of a slightly stratified rock in Dublin Bay, stripping ledge after ledge from the bottom upwards, securing one larva for every one or two square yards worked. The tide washed the base of the rocks. As regards the Shetland forms of so-called *A. cursoria*, all which I have seen have turned out to be *A. tritici*, not one *A. cursoria* amongst them. Mr. Tutt's illustrations of *Gnophos obscuraria* and *Boarmia repandata* do not apply, as they are more geological than geographical varieties. I can take the former of almost any chosen shade around here, by deciding where to work—even within a short walk on to another geological formation. Those from Wallasey are always ochreous; while two miles away, across a marsh, on Bidston Hill, they are rich satin-like in texture, and almost black in colour; but at Llanferris, sixteen miles distant, as the crow flies, they are almost as blue as *Agrotis ashworthii.* In reply to the enquiry whether *Agrotis similans* (*pyrophila*) still occurs in Great Britain, I have pleasure in saying that it may be taken in Lancashire, Westmoreland, Cumberland (where I took it recently), in Cheshire, Flintshire, and in Denbighshire, where I caught the species last season. —C. S. GREGSON; Rose Bank, Fletcher Grove, Edge Lane, Liverpool, April 20, 1885.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—If your correspondent Mr. Tutt had ever bred *Agrotis tritici* and *A. nigricans* he would never have come to the conclusion that they at all events were one and the same species, the larva being abundantly distinct, and also feeding attached to different plants. I find *nigricans* here generally about the roots of sorrel, and of *tritici* on the sand-hills at the roots of *Galium,* though it may also be found at the roots of grass and other plants, but I have never found it about sorrel. It is a much darker and more robust larva than *tritici,* and more resembles that of *Agrotis segetum;* and I apprehend no one will think of making out *nigricans* and *segetum* to be one species, seeing that *segetum* feeds up in the autumn and pupates early in the spring; whereas *nigricans* does not feed up until the end of May or early in June. *Tritici* larva is exceedingly like *A. vestigialis* (*valligera*) larva; they feed together; and I have reared both species without having discerned any difference in the larva, and I apprehend no one will want to make out that *vestigialis* and *tritici* are one species. All this satisfies me that no importance whatever needs to be attached to the results chronicled by Dr. Adolf Rossler and Dr. Pagenstecher of the insects reared from the swarms of larvæ at Ockelheim, seeing that most of the under-ground-feeding larvæ of Agrotidæ have a strong family resemblance, and in such a swarm of larvæ it is hardly likely minute differences would be noted. I, however, intend this year to rear and carefully describe the larvæ of *tritici, vestigialis,* and *nigricans,* and put beyond question the fact that *nigricans* is a true species, and no variety of *tritici.* We take both species here, but never have any difficulty in discriminating between the two; nor do we ever take *A. obelisca* or *A. aquilina.* Probably many so-called *aquilina* and *obelisca* are only *tritici*, which would account for the doubt expressed as to whether *aquilina* and *obelisca* were true species, or only varieties of *tritici*.—J. GARDNER; Darlington.

ON THE PROBABLE IDENTITY OF CERTAIN AGROTIDÆ.—I have just read with interest the remarks on this subject in the last issue of the 'Entomologist' (Entom. xviii. 148), and I should not be surprised if the genus *Agrotis* undergoes considerable revision at no distant date. Of *A. obelisca* I can say nothing, as I have never taken it; but last year I worked the flower-heads of marram-grass (*Psamma arundinacea*) at night for various Noctuæ, and thus obtained several species of *Agrotidæ;* but by far the most abundant of them all was *A. tritici*. Here this species, as in most places, is immensely variable. A fair number of *A. aquilina* and *A. nigricans* were also taken in the same way; and I noticed all three varieties copulating freely with each other. One *A. obscura* (*ravida*), and several *A. vestigialis* (*valligera*) and *A. cursoria*, also fell to my lot; but in no case did I observe any of the last-mentioned species *in copulâ* with *A. nigricans*, *A. tritici*, or *A. aquilina*.—EDWARD A. ATMORE; King's Lynn, Norfolk, May 6th, 1885.

EUPHASIA CATENA NEAR NOTTINGHAM.—Some years ago I wrote to you with reference to a remarkable Noctua, which I saw in 1878 in the collection of an engine-driver at Nottingham, and which I was then quite unable to identify. I had almost forgotten the circumstance, when one day, turning over casually the first volume of 'Humphreys and Westwood,' I came upon the figure of a moth (in plate 54) which I at once recognised as the identical insect. Referring to the index attached to each plate, I found that the "distinguished stranger" was described as "*Euphasia catena*, the Brixton beauty." The collector, in whose boxes I saw it, informed me that he had himself taken it in a lane near Nottingham; and, from the little store he seemed to set by it, I feel pretty confident that this is a true account of the matter. The species seems to be absent from all our recent lists.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, Feb. 7, 1885.

[Appended is the letterpress describing the figure above alluded to:—"*Euphasia catena*, Sowerby. This species measures 1⅛ inch in expansion of the fore wings, which are white, with a brown and grey spot, crossed by three pale lines near the base and towards the costa, a triangular spot of the same colours in the middle of the costa, and the apical margin is lilac, yellow inwardly, and a row of white dots, with lilac centres, forming a chain; cilia yellowish lilac; hind wings white, with the margin slightly brown on the outer angle. A single specimen, taken by Mr. Plumstead, at Brixton, about forty years since (about 1793, Ed.), and now in Mr. Curtis's cabinet, is the only authority for the introduction of this fine insect into our indigenous lists. Boisduval regards it as a native of America, and as probably belonging to his genus *Eudryas*. It is omitted by Mr. H. Doubleday from the list of British Noctuæ." Wood, in 'Index Entomologicus,' figures it at plate 17, fig. 424*a*, and says, "native of India." Dr. Staudinger omits it from his European list. *Euphasia catena* may be ranked as an "accidental visitor" to this country, probably introduced in earth surrounding some plant imported from abroad.—Ed.]

Tæniocampa leucographa near Tunbridge Wells.—Whilst staying at Groombridge, near Tunbridge Wells, last month, I took a very fair specimen of the above-named insect whilst working some sallows.—W. H. Blaber; Beckworth, Lindfield, Sussex, May 24, 1885.

Hermaphrodite Lepidoptera.—On August 17th, 1880, I captured a Geometer larva crawling on a fence at Herne Hill, near London, evidently in search of a suitable place to undergo its transformation. Being desirous of rearing the insect, I placed it in a box with some elm leaves, and on looking at it two days afterwards I found it had changed into a bright green pupa within one of the leaves which it had rolled up. On September 4th the moth appeared, having the wings and antennæ of the right side completely male, those of the left female; the palpi, eyes, and body, on each side also exhibiting the same sexual differences. Both male and female external sexual organs were present at the extremity of the abdomen, the "anal tuft" of the male being notably conspicuous. The pupa shell, which I have carefully preserved, is interesting, showing as it does all the peculiarities as plainly as the moth. Mr. W. F. Kirby identified this insect as *Eugonia* (*Ennomos*) *angularia*, and invited me to exhibit it at the October meeting of the Entomological Society of London, which I did. The second hermaphrodite I have met with is a specimen of *Plusia verticillata*, which I captured in the larval state at Wakapuaka, Nelson, on January 10th, 1882, the moth unfortunately emerging with the wings much deformed on February 6th. In this instance the difference is only observable in the colour of the wings, which are lighter and with a faint pink blush on the right side as in the female. In all other respects the insect is a male. Grease has now almost completely ruined this already very poor specimen. Another insect which I believe to be hermaphrodite in its nature is a specimen of *Vanessa gonerilla*, bred in January, 1883. The larva, which was the latest in changing, and much starved owing to the nettles running short, appears to have had much difficulty in turning into pupa, as it fell down and knocked in the right wing-case and left palpus. When the butterfly emerged in a fortnight's time I noticed that the wings of the right side, although perfectly formed, were much smaller and more deeply indented than those of the left, the anterior margin of the right wings being, in addition, considerably more convex. The antenna on the right side is, also, nearly half a line shorter than its fellow, and the abdomen on the right side has shrunk up, the left side retaining its original form. These peculiarities may be said to arise from the accident which befel it when undergoing its transformation, but the fact of the abdomen collapsing on the right side cannot, I think, be attributed to this cause, indicating, as it does, an internal difference of structure, viz., the absence of a right ovarium. On examination, the external sexual organs appeared to be rudimentary.—GEO. VERNON HUDSON; Karori, Wellington, New Zealand.

RETINIA TURIONANA.—I have collected lately a lot of pupæ of this species; up to this date I have bred thirty-two ichneumons and two moths.—WILLIAM MACHIN; May 14, 1885.

NOTES ON PLATYPTILIA GONODACTYLA.—The last sentence of Mr. Gregson's letter, as to the likelihood of having another "plume" to account for in our collections, has induced me to write a few words with regard to the above species, which still puzzles some of those who ought long ago to have cleared up any mystery there may be in the economy of such a common species. As far back as 1880, in vol. xiii. of the 'Entomologist,' p. 283, Mr. Machin writes, "*P. trigonodactylus* (*gonodactyla*) was abundant in June; the second brood equally abundant on Saturday, the 4th of September." Mr. Gregson and Mr. South do not appear to be aware of the fact that this species is double-brooded, or, if they are, their notices would lead one to suppose they are not; for Mr. South, in his description of the species (Entom. xv. 31, 32), states:—"The larva feeds in *Tussilago farfara* during April and May;" and that "the pupa may be found among the seed-down in May." He does not allude even to the probability of a second brood, although the fact had been previously recorded as above. Mr. Gregson writes, in the last issue of the 'Entomologist' (Entom. xviii. 151), "We have a coltsfoot-feeding larva in Wales, in June, which makes a gallery through the fluff on the under sides of the leaves," and at once suggests, "Can this be the larva of *P. farfara?*" As June and July are the months when the second brood of larvæ of *P. gonodactyla* are feeding, and as the second brood of this species cannot then feed on the flower-heads, because there are none, I think it would be much more reasonable to suppose that the larvæ he refers to are those of *P. gonodactyla*, rather than those of *P. farfara.* It ought to be no trouble to breed the fluff-mining larva, and put all doubt at rest, besides the satisfaction of giving us something new, should Mr. Gregson's suggestion turn out correct. I think, however, were he to breed these summer larvæ, he would most probably find that the imagines were smaller, darker, and dingier—most certainly not redder—than the early brood of *P. gonodactyla.* The colour of the second brood of this species seems to be a more uniform grey, nothing like so sharply marked as in the first brood. This is especially the case when the insects come out early, and get through their metamorphoses rapidly, when the more dingy appearance of the second brood is not improved by being apparently bleached, which is sometimes the case with the most perfect specimens. Mr. South's remark as to the appearance of his bred series (Entom. xv. 32), when compared with later-caught specimens, appears to bear out the above suggestions, and to show that when the insects, through artificial circumstances, are hurried through their changes, even in the early brood, they will produce a bleached form. Mr. South's description of the larva, from which he bred his bleached-looking specimens, struck me as being a good description of the larva of the early brood obtainable here. As I am away from home the greater part of the time when the second brood is in the larval state, and as this brood can always be obtained abundantly in the autumn, I have never reared it. My experience of the imagines of *P. gonodactyla* may be summarised as follows:—1. There are two broods; one occurring in June, the other in the latter part of August, September, and October. 2. The second brood is generally smaller, and not so decidedly marked, the earlier specimens of this brood especially having a bleached appearance. 3. The imagines vary widely in size, colour, and intensity of markings, from the same locality. I have taken some hundreds of the species, and bred many; and there is no doubt that the extreme forms might, by those ignorant of the species, be taken as allied species. But if we are to take every shade of colour and difference of size as determining a species, we shall soon get our plumes into the same condition as we seem to have got the genera *Agrotis* and *Scoparia*.—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., May 10, 1884.

THE GENUS PLATYPTILIA.—In the note appended to my description of *P. gonodactyla* (*trigonodactylus*), (Entom. xv. 32), I solicited further assistance to enable me to elucidate some difficulties which presented themselves in the satisfactory identification of certain forms of this species (?) seen by me in collections. To this end I asked for larvæ of the coltsfoot-feeding "plume" from any locality, but none were sent me. Although I have not myself met with specimens later than the first week in July, I have been informed by Mr. Machin and other entomologists that there are two broods of *gonodactyla* in the year. Granted that there are two broods, and that the individuals of the second brood are generally smaller and less decidedly marked than those of the first brood, we still lack an important item of knowledge. What is the larva of the second brood like? Is it identical with the larva which feeds and pupates in the seed-heads of the coltsfoot? Recent experience with certain species of Lepidoptera has induced me to conclude that colour and ornamentation are not in all cases thoroughly trustworthy characteristics whereby we can differentiate species. The genus *Platyptilia* is a most perplexing one; and until we know the larvæ of not only all the species, but in the case of a horeomorphic species, such as *gonodactyla* would appear to be, of each form of the species, we shall be unable satisfactorily to determine the species of this genus. I have lately had a favourable opportunity of comparing some of our British Pterophoridæ with continental types other than those I already possessed; and among other things I was convinced that the *zetterstedti* of our lists is not the *zetterstedti* of Zell. In fact I question if Zeller's species has ever occurred in this country. On the other hand, I believe that the insect described by me (Entom. xv. 33) as *zetterstedti*, Zell., has not as yet been observed on the Continent. Again, I should not be greatly surprised if my *tæniodactylus* proved to be a form of our pseudo-*zetterstedti*. At present the two insects appear sufficiently distinct, but "breeding" may show that they are only forms produced from identical larvæ. The larva of *Platyptilia farfarella*, Zell., burrows, I believe, in the tomentose under sides of the leaves of *Tussilago farfara;* and I am inclined to think that probably the plume-moth, bred from a larva found feeding "in, or under, the woolly under sides of a coltsfoot leaf," by Mr. Gregson, in Wales, and recorded in the 'Entomologist' (Entom. vi. 427), and again referred to (Entom. xviii. 151), was the *farfarella* of Zeller; but whether *farfarella* is specifically distinct from *gonodactyla*, Schiff., or is only a seasonal form of that species, I am not prepared to say. In an early number I will give a description of the imago of *Platyptilia farfarella*, Zell. —RICHARD SOUTH; 12, Abbey Gardens, London, N.W., May, 1885.

EPISCHNIA FARRELLA, CRAMBUS ALPINELLUS, &c., IN NORFOLK. —Last year I took on our coast a fine series of *Epischnia farrella*. The species was local, and apparently like many insects taken in such situations it soon becomes worn; and an effort to procure eggs from living females proved a failure. During the afternoon of August 11th I disturbed from the grass on the sand-hills a *Crambus* quite new to me; and a second specimen was taken by my brother on the same occasion. These, whilst on the setting-boards, were recognised by Mr. W. Warren as *Crambus alpinellus*. I may note here that in the same place *C. fascelinellus* was by no means rare; but the abnormal heat (the thermometer registering 98° F. in the shade) made entomological work on the sand-hills well nigh intolerable. On the 6th of August I found *Agdistes bennettii* so common in an adjoining salt-marsh, shortly before dusk, that I boxed upwards of forty specimens, in, I believe, little more than ten minutes.—EDWARD A. ATMORE; King's Lynn, Norfolk, May 6, 1885.

NOTES ON GALL COLLECTING.—For the last seven or eight years I have devoted my spare time from December to April in collecting galls of various species, making from sixteen to twenty journeys each year. A long rod is indispensable, and some patience is required to fill my eight large cages. With me gall collecting has not proved a success; but it has this advantage,—it can be pursued during the winter, when there is little or nothing else to be done in Entomology, and the specimens of moths reared from them are always in the finest possible condition. My principal object has been to complete my series of *Ephippiphora obscurana;* of this I have only netted two specimens in the perfect state during my thirty years' collecting. I have bred from galls the following Lepidoptera (besides a host of species of other orders, which I do not collect):—*E. obscurana,* scarce; *Coccyx splendidulana* and *C. argyrana,* common; *Heusimene fimbriana,* not common, and principally from the Kentish woods; *Teleia luculella,* common, and *Gelechia scalella* (*aleella*), scarce; *Bucculatrix ulmella,* a fair series; *Œcophora lunarella,* nine the first year, but none since; and two or three of the genus *Nepticula.* — WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., May 14, 1885.

APHIDES AND THEIR PARTIALITY FOR STRONGLY-SCENTED PLANTS.—The predilection of Aphides for the leaves of highly-scented conservatory plants, and plants bearing fragrant flowers, is certainly remarkable. For instance, the strongly-perfumed pelargoniums are peculiarly liable to become infested; the other geraniums—with the exception of the ivy-leaved, the leaves and scent of which bear so extraordinary a resemblance to the plant after which it is named—are never, or "hardly ever," thus blighted; and it may be noted that the stronger the odour the more liable to Aphis attack,—the nutmeg, the oak-leaf, the lemon, and the old-fashioned "unique," with its scent of peppermint, being especial penchants of the green-fly. Look, too, at the rose ("sweetest flower that grows"), at the lemon verbena, the *Daphne odorata,* and the carnations, how thickly covered they all become with the detestable little pests. With plants out of doors the rule seems to be reversed, for whilst gooseberry and currant trees, white and red, are frequently sadly disfigured by thick swarms of Aphides, the aromatic black currant and the poisonous (?) American *Ribes* escape unmolested. The only reason for the preference given to the scented plants of the green- and hot-house, that I can suggest, is that they are, as a rule, more succulent and juicy than others; and it may be the aroma imparts a flavour which, to the "goût" of Aphis epicures, is somewhat analogous to the "bouquet" of choice wines.—JOSEPH ANDERSON, jun.; Chichester, April, 1885.

NORTH KENT ENTOMOLOGICAL SOCIETY.—The first bi-annual meeting of this Society was held on Thursday, May 7th, at the "Duke of Connaught" Coffee Tavern, New Road, Woolwich. Mr. J. B. Smith, vice-president of the Society, occupied the chair. After some remarks from the chairman, the officers for the ensuing six months were elected; and the Secretary read a report of the progress of the Society, which was formed in November, 1884, and now numbers seventeen members, a large majority being working men. During the past six months there have been some very interesting exhibits made by various members, and discussions of all subjects concerning Entomology, from which the younger members have derived much benefit. The Society has evidently supplied a want long felt by entomologists in the locality.—H. J. WEBB, Hon. Sec.; 5, Down's Place, Plumstead, May, 1885.

REVIEW.

Russian Central Asia; including Kuldja, Bokhara, Khiva, and Merv. By HENRY LANSDELL, D.D. With maps and illustrations. 2 vols., 8vo. London: Sampson Low & Marston, 1885.

THIS work has been handsomely produced, and appears to be the result of careful observation conducted in the countries visited and described. The notes on the Natural History of that part of Central Asia are of interest, as little was previously known upon the subject by western naturalists. This information is contained in very copious appendices. It does not consist of original work by the author; but he has done perhaps better service by having reproduced in English that which had been already recorded by Russian naturalists in the Russian and German tongues, and the whole will form a valuable basis for future investigations. The different sections have been edited by experts, so that we may look upon the lists as authentic copies from the original works of the Russian students.

The body of the work treats upon a large number of subjects, as will be gathered from the general index, which contains some 5000 entries. These are most diverse, and include Meteorology, Education, Crime, Disease, Botany, Silk-culture, Bee-keeping, &c.

We can fully recommend this work as one which will add much to our knowledge of a little-known portion of the world that ought to be studied by all Englishmen interested in the foreign relations with British possessions.

OBITUARY.

Nicholas Cooke.—We much regret to have to record the sudden death of Nicholas Cooke, of Gorsey Hey, Liscard, Cheshire. Mr. Cooke was born at Liverpool, 14th of January, 1818, and died on May 19th, 1885, at the residence of Mr. Briggs at Leatherhead, where he had gone to spend the evening, in company with Messrs. Howard Vaughan and Carrington. Mr. Cooke was a member of a well-known family, members of the Society of Friends, his father having founded one of the oldest firms of cotton-brokers in Liverpool. The subject of this notice had for many years been connected with a house of wool-brokers. The taste for Entomology appeared to have been born in the family, for when quite children he and his brother, the late Benjamin Cooke, long before they had heard of Entomology as a science, caught butterflies, moths, and other insects, and pasted them in large numbers on the walls of their nursery. This taste was fostered and organized on their becoming students at the Friends' School at York, where at the same time were other scholars with a like taste, who afterwards became eminent entomologists, among them being Edwin Birchall and Thomas Allis. Nicholas Cooke seldom published anything on Entomology except in the briefest terms. This is greatly to be regretted, as with him dies an immense fund of information. As a collector he was most successful, and his name must always be associated with the discovery of *Nyssia zonaria* and other species in Britain, as well as the capture of *Sesia scholiiformis* and *Crymodes exulis*, both of which species were taken by him in greater numbers than by anyone else in this country. His collection had become one of the largest in England. He had incorporated with it the whole of the late Mr. Greening's (of Warrington) and the major portion of the late Edwin Birchall's. His series were generally the full length of the drawer, giving opportunity for the study of local and other variation, the *Sesiidæ* and the genus *Eupithecia* being probably unequalled. The field of his work included not only the districts around his home, but extended to North Wales, Lancashire, the Lake district, and the Highlands of Scotland, which latter he had annually visited for many years past, making Loch Laggan his headquarters. In conjunction with Mr. Samuel Capper and other friends he was instrumental in founding the Lancashire and Chesire Entomological Society, which now numbers some fifty members. In this Society he took great interest, and was one of the vice-presidents. It is highly satisfactory to learn that his collections will remain intact, it being found by a codicil added to his will within a month of his death that he has bequeathed the whole to the Mayor and Corporation of the City of Liverpool, and they will doubtless be deposited in the Brown Museum in that city. These collections consist of British Lepidoptera, an almost complete one of European butterflies, and one equally perfect of British birds' eggs. For some time before his death Mr. Cooke was engaged rearranging the Lepidoptera according to the 'Entomologist' List. He was interred at the Wallasey Cemetery, his funeral being largely attended, many of the entomologists of the Liverpool District being present. Mr. Cooke leaves a widow and family, the latter being grown up, his eldest son, Mr. Isaac Cooke, being a successful and rising artist. His death was caused by heart-disease, contracted by over-exertion in April last, when he was overtaken by storm while fishing on Loch Laggan. The labour of a five miles' row against a strong wind had produced injuries which have proved fatal.—J. T. C.

THE ENTOMOLOGIST.

VOL. XVIII.] JULY, 1885. [No. 266.

THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

AMONG the various Natural-History Societies which exist throughout the country only a few are strong in entomologists. This, however, is the case with the Burton-on-Trent Natural-History and Archæological Society; and during the past winter the members of its entomological section have occupied themselves in compiling a new list of the Lepidoptera of that neighbourhood, which, if it does nothing else, will prove that the midland counties are not quite such a barren hunting-ground as some would have us believe. The members have had the advantage of using two old lists,—one by that renowned entomologist, Mr. Edwin Brown, and contained in Sir O. Mosley's 'History of Tutbury'; the other by Mr. W. Garneys, and embodied in his work, 'The Fauna and Flora of Repton.' To these are added the observations of about a dozen living collectors, each contribution being distinguished by the initials of its finder's name. The district covered is rather a wide one, extending from fifteen to twenty miles round Burton in every direction, and has not been worked, so far as we are aware, by any other Society. It includes two famous localities,—Cannock Chase, the original British habitat of *Lasiocampa ilicifolia;* and Chartley Park, the southernmost limit of *Cœnonympha typhon;* the river Trent passing through the centre. The 'Entomologist' List has been followed throughout.

The observers, whose initials appear in our local list, are as follows:—E. Brown, W. Garneys, J. T. Harris, G. Baker,

P. B. Mason, C. F. Thornewill, G. A. Smallwood, T. Gibbs, J. E. Nowers, G. H. Whitlock, and W. M. Anderson. Mr. R. Freer, of Caius College, Cambridge, has also furnished some valuable notes on the Cannock Chase district; and one or two contributions have been received from Mr. Blatch, of Birmingham.

Not much has been done at sugar, and a large proportion of the species have been bred from larvæ. Mr. Smallwood is the only member who has practised pupa-digging to any appreciable extent.

The following remarks upon the geological features of the locality have been prepared by Mr. Frank E. Lott, A.R.S.M.

The district included in this paper, having an area of 1000 square miles, it is impossible to give an extended geological notice. We may, however, mention some of the broad features of the district; and this, with a list of the principal localities, geologically classified, may perhaps be of some service, as indicating the influence of Geology on comparative Entomology.

In the first place there is a *valley area* of over 300 square miles, watered by the Trent and its tributaries—the Derwent, Dove, Tame, and Soar.

Secondly, with Burton as a centre, there are the following *elevated areas:*—Needwood Forest, on the north-west, about thirty square miles of well-wooded land, from 300 feet to 500 feet above sea-level. Cannock Chase, a heather-covered upland, about twenty square miles, from 350 feet to 600 feet, lies still more to the west. Charnwood Forest, in the east, is a rocky district, of some twenty square miles, irregular in outline and elevation, rising in parts, such as Bardon Hill and Breedon, to as much as 800 feet. The Weaver Hills, 800 feet, and Thorp Cloud, in the north, are really portions of the great limestone plateau of Derbyshire.

The prevailing geological formation is New Red, both Bunter and Keuper being represented, the former chiefly as Middle Bunter,—the mottled sandstone occurring but sparingly,—the latter largely, as Upper Keuper marls and Lower Keuper sandstone.

The great anticlinal of the Pennine Range extends across the Trent Valley, causing the inliers of limestone (partially dolomitized) at Ticknall and Breedon, and ending with the mass of Archæan rocks, forming Charnwood Forest.

There are five coal fields, more or less, included,—the whole of the Leicestershire and portions of the Warwickshire, North and South Staffordshire and Derbyshire. The soil of much of this district is formed from the boulder-clay and drift-gravels, but little modified by the underlying formations.

FORMATIONS, ROCKS, ETC.	LOCALITIES IN LIST.
Archæan.	Charnwood Forest.
Intrusive greenstone.	Bardon Hill.
Mountain limestone.	Dovedale, Ticknall.
Mountain limestone and Upper Keuper marls.	Breedon Cloud Wood, Calke Abbey.
Yoredale Shales, and Bunter conglomerate and alluvium.	Ashbourne and Okeover.
Yoredale Shales, Gritstone, with alluvium.	Little Eaton.
Gritstone.	Breadsall Moor and Belper.
Gritstone and Bunter conglomerate.	Repton Rocks and Shrubs, and Bretby Park.
Coal measures.	Ashby, Newhall, Cheadle, Cannock, Ilkeston.
Bunter conglomerate.	Cannock Chase, Repton, Milton, Seal Wood.
Lower Keuper sandstone.	Winshill, Brizlincote.
Lower Keuper sandstone, Bunter conglomerate, with alluvium.	Rugeley.
Keuper marl and alluvium.	Burton, Branstone, Barrow, Willington, Rollestone, Eggington, Derby, Long Eaton, Loughboro', Drakelow, Cauldwell, Horninglow, Stafford, Rugeley.
Keuper marl.	Somershall, Cubley, Marchington, Chartley Park, Etwall, Findern, Grange Wood, Tatenhill, Atherstone.
Keuper marl and boulder-clay.	Sinai Park, The Oaks, Knightley Park, Hoar Cross.
Rhœtic beds and boulder-clay.	Needwood Forest, Swilcar Wood, and Bagots Park.

RHOPALOCERA.

Aporia cratægi, a nest of larvæ found by Rev. F. M. Spilsbury, in his garden, at Barrow-upon-Trent, feeding on apple.

Pieris brassicæ, P. rapæ, P. napi, common throughout the district.

Euchloë cardamines, common throughout the district.

Colias edusa, clover fields at Repton (W. G.), Horninglow, Newton

Solney, and Brizlincote (J. T. H.), Winshill (G. B.), Branstone (J. E. N.), Ashby (G. A. S.). Variety *helice*, clover fields at Repton (W. G.).

Gonopteryx rhamni, Seal Wood and Dovedale (J. T. H.), Repton Shrubs (G. B.), Egginton (W. M. A.).

Argynnis selene, Bagot's Park (C. F. T.), Dovedale and Chartley (J. T. H.), Charnwood Forest (J. E. N.). *A. euphrosyne*, formerly in Repton Shrubs and Seal Wood (E. B. and J. T. H). *A. aglaia*, abundant on Cannock Chase (J. E. N. and C. F. T.). *A. paphia*, Repton Shrubs and Seal Wood (E. B.), formerly in Repton Shrubs (J. T. H.), formerly at Anker Church (W. G.).

Melitæa aurinia (*artemis*), Charnwood Forest (E. B.), one at Burton (G. H. W).

Vanessa c-album, Repton Shrubs and Seal Wood (E. B.), Repton (W. G.), Bardon Hill (J. T. H.), Calke Abbey (H. A. Stowell). *V. polychloros*, scarce (E. B), Needwood Forest and Dovedale (J. T. H.), one at Burton (W. J. Pickering), one at Barrow (G. A. S.). *V. urticæ*, common throughout the district. *V. io*, occurs occasionally throughout the district. *V. antiopa*, once at Milton (W. G.). *V. atalanta*, occurs throughout the district, some years abundantly. *V. cardui*, abundant throughout the district some years.

Pararge ægeria, Seal Wood (E. B.), Repton Shrubs (W. G.), Bardon Hill (J. T. H.). *P. megæra*, common (E. B.), scarce since 1861 (W. G.), forest banks, Needwood (J. T. H.), Charnwood Forest (J. T. H.).

Satyrus semele, Bunster Hill, Dovedale (J. T. H.).

Epinephele ianira, common throughout the district. *E. tithonus*, common (E. B. and W. A.), Sinai Park (G. B.), Charnwood (J. T. H.). *E. hyperanthes*, common in woods (E. B.), Repton Shrubs (W. G. and G. B.), Seal Wood (W. G. and J. T. H.), Needwood Forest (T. G.).

Cœnonympha typhon (*davus*), Chartley Moss (J. T. H.). *C. pamphilus*, Chartley Park and Charnwood Forest, abundant (J. T. H.), Bagot's Park, abundant (C. F. T.), Cannock Chase, abundant (J. T. H.).

Thecla betulæ, taken on Cannock Chase (R. F.). *T. w-album*, Burton-on-Trent and Brizlingcote, but rare (E. B.), Repton Shrubs, abundant (G. B.), Seal Wood (J. E. N.). *T. quercus*, Repton Shrubs (E. B.), Seal Wood (G. B.), Charnwood Forest (J. T. H.). *T. rubi*; Dovedale, plentiful formerly (J. T. H.), Cannock Chase, abundant (J. E. N. and R. F.).

Polyommatus phlæas, common (E. B. and W. G.), Tatenhill (W. M. A.), Chartley Park (J. T. H.), Cannock Chase (C. F. T.), Bretby Park, Repton Rocks, and near Repton Shrubs (T. G.).

Lycæna astrarche (*agestis*), Dovedale (E. B.). *L. icarus* (*alexis*), generally distributed throughout the district. *L. argiolus*, scarce round Repton (W. G.), abundant in Needwood Forest. *L. minima* (*alsus*), common in Dovedale (J. T. H.).

Nisoniades tages, Dovedale (E. B. and J. T. H.).

Hesperia thaumas (*linea*), not uncommon (E. B.). *H. sylvanus*, not uncommon (E. B.), Bagot's Park, common (C. F. T.), Chartley (J. T. H.). *H. comma*, Chartley (J. T. H.).

HETEROCERA.—SPHINGES.

Acherontia atropos, larvæ on potato and tea tree (E. B.), occasionally in some abundance (W. G.), Willington (F. M. S.), occurs occasionally throughout the district.

Sphinx convolvuli, occurs occasionally (E. B.), Repton, some years ago in some abundance (W. G.), Barrow (G. A. S.), several specimens recently taken in Burton. *S. ligustri*, not unfrequent (E. B. and W. A.), Findern (G. A. S.), one larva at Stapenhill (C. F T.).

Chærocampa eelerio, one taken in Bass & Co.'s yard, November, 1880 (G. B.). *C. porcellus*, single specimens taken in Rugeley several years (R. F.). *C. elpenor*, frequent, in larval state (E. B.), scarce, larvæ in wet places (W. G.), larva on apple at Barton (C. F. T.), one pupa (G. B.), one larva at Shobnall (J. T. H.).

Smerinthus ocellatus, common in orchards (E. B. and W. G.), occasionally on apple (J. E. N.), on *Populus alba* in Bretby Lane (J. T. H.). *S. populi*, common throughout the district. *S. tiliæ*, Cubley (E. B.).

Macroglossa stellatarum, occurs in abundance some years.

Trochilium apiformis, larvæ on poplars, Findern cover (W. A.). *T. crabroniformis* (*bembeciformis*), in osier beds occasionally (E. B.), osier beds at Repton (W. G.), Burton (J. E. N.), Newton (J. T. H.), Little Eaton (G. B.).

Sesia sphegiformis, several specimens were taken a few years ago in Repton Shrubs among young alders (E. B.), Repton Shrubs (J. T. H.). *S. tipuliformis*, common throughout the district. *S. asiliformis* (*cynipiformis*), some specimens, chiefly females, taken on stumps of trees in Repton Shrubs (W. G.). *S. culiciformis*, Repton and Seal Woods (E. B.), one specimen in Seal Wood (J. T. H.).

Ino statices, frequent in meadows (E. B.), in mowing grass, near Milton (W. G.), in meadow, near Stanton (J. T. H.), Ashborne and Dovedale (J. T. H.).

Zygæna lonicerœ, Repton Shrubs (E. B.), in mowing grass on Burnet, &c. (W. G.). *Z. filipendulæ*, common (E. B.), in mowing grass on Burnet, &c. (W. G.), Dovedale, common (J. T. H.).

BOMBYCES.

Hylophila prasinana, common throughout the district.

Nola cucullatella, common throughout the district. *N. confusalis*, Burton (E. B.), at rest on trees in Repton Shrubs (W. G.).

Nudaria mundana, scarce (E. B. and W. G.).

Lithosia lurideola (*complanula*), common (E. B.)—(W. G.), larva at Willington (C. F. T.).

Deiopeia pulchella, said to have once occurred at Repton ('Entomologist,' xvii. 141).

Euchelia jacobææ, occurred some years ago in a garden at Burton (E. B.), plentiful on Charnwood Forest (E. B. and J. T. H.).

Nemeophila russula, Chartley Moss (J. T. H.), Cannock Chase, common (F. R.). *N. plantaginis*, Dovedale (E. B. and G. B.), Bardon Hill (J. T. H.)

Arctia caia, common throughout the district.

Spilosoma fuliginosa, Newton Solney and Dovedale (E. B.), once at Willington (W. G.), Chartley and Bardon Hill (J. T. H.), Cannock Chase (R. F.), once at Little Eaton (G. S.). *S. lubricipeda* and *S. menthastri*, common throughout the district. *S. mendica*, near Marchington (E. B.). *S. urticæ*, larvæ found once near Burton (E. B.).

Hepialus humuli, common throughout the district. *H. sylvanus*, common (E. B.), Tatenhill (J. T. H.), once in Bretby Park (T. G.). *H. velleda*, Seal Wood (E. B.), one in Repton Shrubs (W. G.), common at Bretby (T. G.). Variety *gallicus*, common at Bretby (T. G.). *H. lupulinus* and *H. hectus*, common throughout the district.

Cossus ligniperda, generally distributed throughout the district.

Zeuzera pyrina (*æsculi*), Yoxall (E. B.), Newton Solney, *in cop* (J. T. H), larva in pear, at Rolleston (G. B.), larva in quince, at Burton (C. F. T.), once at Burton (S. R. Hallam).

Porthesia similis (*auriflua*), common throughout the district.

Leucoma salicis, Burton (E. B.), Burton, abundant (G. B.), on poplars at Findern (W. G.).

Dasychira pudibunda, Henhurst, but rare (E. B.), scarce (W. G.) Findern (G. A. S.).

Orgyia gonostigma, one larva taken at Rugeley (R. F.). *O. antiqua* common throughout the district.

Trichiura cratægi, rare (E. B.), larvæ on highest shoots of hawthorn (W. G.), Tutbury Road (G. B.), Willington (J. E. N.), one near Ashby-de la-Zouch (G. A. S.).

Pœcilocampa populi, occurs occasionally (E. B.), Needwood Forest (J. T. H.), near Repton (P. B. M.), Repton village (C. F. T.), Ashby (G. A. S.).

Eriogaster lanestris, common (E. B.)—(W. G.), Needwood Forest and Willington (J. E. N.).

Bombyx rubi, Dovedale (E. B.), plentiful in Dovedale (J. T. H.), Cannock Chase (G. W. Blatch). *B. quercus*, not common (E. B.), occur occasionally throughout the district.

Odonestis potatoria, common throughout the district.

Lasiocampa quercifolia, a few larvæ taken near Rugeley (R. F.). *L. ilicifolia*, Cannock Chase (E. B. and R. F.).

Saturnia pavonia (*carpini*), one larva at Tatenhill (E. B.), common on Cannock Chase (J. T. H. and R. F.).

Drepana lacertinaria, near Ashby (G. A. S.). *D. falcataria*, Seal Wood (E. B. and G. H. W.), Chartley (J. T. H.).

Cilix glaucata (*spinula*), common throughout the district.

Dicranura bicuspis, on alder, but rare, Eggington, &c. (E. B.), Rolleston Park (C. F. T.). *D. furcula*, on willows, but not common (E. B.), Repton (P. B. M.), Repton Shrubs (G. B.), Barrow-on-Trent (G. A. S.), Charnwood Forest (E. H. Todd). *D. bifida*, fairly common throughout the district. *D. vinula*, common throughout the district.

Pterostoma palpina, Seal Wood and Repton Shrubs (E. B.), Burton (G. B.), Barrow (G. A. S.).

Lophopteryx camelina, common throughout the district.

Notodonta dictæa, Seal Wood and Burton (E. B.), near Repton (W. A.), Stapenhill (J. T. H. and G. B.), Derby (G. A. S.), near Ashbourne (H. F. G.). *N. dictæoides*, once at light, at Derby (G. B.). *N. dromedarius*, Repton Shrubs and Derby (G. B.), near Ashby (G. A. S.). *N. ziczac*, Seal Wood (E. B.), near Repton (W. G.), Repton Shrubs (G. B.), Derby (H. F. G.), one near Barrow (G. A. S.). *N. chaonia*, Repton Shrubs (G. B.). *N. trimacula* (*dodonea*), Seal Wood (E. B.), Repton Shrubs (G. B.).

Phalera bucephala, common throughout the district.

Pygæra curtula, Burton (E. B.).

Thyatira derasa and *T. batis*, fairly common throughout the district.

Cymatophora duplaris, Henhurst (E. B.).

Asphalia diluta, Henhurst (E. B.), near Ingleby (W. G.). *A. flavicornis*, Repton Shrubs (J. T. H. and G. B.), one at Burton (W. J. Pickering), Barrow (G. A. S.), common in Birch Valley, Cannock Chase (R. F.).

(To be continued.)

ADDITIONAL NOTES UPON SETTING LEPIDOPTERA UNPINNED.

BY GEORGE COVERDALE.

A YEAR has now elapsed since the attention of entomologists was called, in the pages of this magazine, to the advantages of setting insects unpinned (Entom. xvii. 131). During that period no efforts have been spared to effect improvements in this system and render it more practical and easy of accomplishment, and it is indeed a source of satisfaction to find that the thought and labour bestowed upon the subject has resulted in some radical changes for the better. I therefore again venture to press upon entomologists, especially Micro-Lepidopterists, the advisability of giving a fair and impartial consideration to the merits of this system and the advantages to which it lays claim. The whole process consists essentially of two distinct stages; the insects have first to be *set*, and afterwards *mounted*, upon a support, and the way in which this is accomplished I shall now proceed to describe.

Setting.

Suppose we have a *Nepticula* to deal with. After it is killed, throw it on to the setting-board. With the setting needles then turn it on to its ventral surface and hold the insect down (say with the left hand) with one needle by gently pressing the body where the abdomen joins the thorax, that is to say, at the base of the anterior wing on the inner margin. A breath will now blow out at least one pair of wings, probably the right hand pair, perhaps both; but this depends upon the position in which the setting needle is held. If only one pair is blown out, change the setting needle to the right hand and repeat the operation, when all the wings will be expanded. At this stage the position of the legs and antennæ may advantageously receive attention, the first and third pairs of legs being the most important. The next thing is to place the insect, wings expanded, upon the groove of the setting-board, but before proceeding further it should be noted that the size of the groove, both as regards width and depth, is a most important matter. It should certainly not be wider than the thorax of the insect, even a tight fit being sometimes an advantage, and its depth just sufficient to allow the body to touch the bottom of the groove with the wings resting flat upon the board. With a steady hand now raise the insect up by sliding the two setting needles one under each pair of wings and lifting it into the groove of the board. If the size of the groove has been properly chosen a slight pressure with the needle will suffice to retain the insect in its proper position for setting, or perhaps a pin or a brace may be required for that purpose. The wings are now to be got into position for bracing, which is best accomplished by pushing them up not ***horizontally***, ***but by*** working in a ***curve vertically***. A little reflection will show that one might expect such a result, because this is the natural line followed by the up and down motion of the wings in flight, and they move much more freely in this direction than in any other. Indeed I have on many occasions set out a *Nepticula* on the board without placing it into the groove at all, or employing any means whatever to keep the body still, such a delicate operation being utterly impossible without a due regard to this important matter, and I must urge upon all who wish to succeed the imperative necessity of careful thought and attention to these details of manipulation. Large insects will require some little modification in the process, such as a couple of pins placed against the shoulders, and sometimes cross ones to keep the abdomen down, but the principle is the same for all. An hour's practice will teach these points far better than I can describe them. Our *Nepticula* being now properly set, the next thing to consider is the mounting.

Mounting.

This, of course, is not commenced until the *Nepticula* is dry. Take a pin (say a No. 20), cut off the head, and with the forceps turn down at right angles a short piece of the pin, a little shorter than the body of the insect. The *Nepticula* should now be unbraced and placed on its back on the edge of the setting-board, so that its antennæ may project over and not get broken. Stick the bent pin into a little block of cork, which will serve for a handle, and then dip the bent portion into a solution of shellac in spirit, and apply the pin to the ventral surface of the thorax and abdomen, so that the small bent portion points to the head of the insect. If the shellac is sufficiently liquid the pin will instantly adhere, and with the forceps may be stuck into the setting-board to dry. As this drying process goes on a little attention will be required to keep the insect in a horizontal position. This is easily accomplished by occasional touches with the setting needle. If the shellac is too liquid it will penetrate the body, and perhaps spread to the wings of the insect, which will then have the appearance of having become greasy; if not sufficiently liquid, the adhesion of the insect to the pin will be imperfect and insecure. A few trials will soon disclose the happy medium. If the shellac is in a watch glass or any very open vessel a drop or two of spirit must be occasionally added to make up the loss by evaporation. It is a good plan to use the shellac from a small test-tube. With larger insects, such as Tortrices, the head of the pin is first beaten out flat, and then turned down, this giving a larger surface to support the body; with larger insects still, such as Pyrales, the head of the pin, after being beaten out, is split up with a pair of scissors so as to form a fork, and then turned down as usual; with even larger things, such as Sphingidæ, the two ends of the forked part may be turned upwards with the forceps, so as to form a cradle which admirably supports the bodies of the largest species. Indeed there is here a wide field open for originality and ingenuity, almost every group of insects demanding some modification in their treatment to suit their own special structure. Of course, different size pins are used to accommodate the various species, but I think it would be well to adopt one uniform height at which they should be supported from the surface of the cork. This is, evidently, an easy matter, depending upon the length which is turned down and the thickness of the thorax.

On referring to the plan which I last year recommended, it will be seen that the process has been much simplified. In the setting, there is now no occasion for the supports formed of pins stuck into a piece of cork, and consequently no coaguline is required. In the mounting, the pith blocks are done away with in favour of the bent pin, which is more sightly, is stronger, being all of one piece, and permits a free view of the insect from beneath. I have also given up gum tragacanth in favour of shellac in spirit. The advantages of this new method have previously been enumerated, so there is no occasion to repeat them, but I will devote a few words to the consideration of the points which have been raised against it. In the first place it is said to be difficult to remove an insect from the middle of a series. This, I will admit, is not an easy matter with the ordinary thick forceps, but after a little practice I find no difficulty when slender curved forceps are employed, and when the insects are very close together they may generally be approached from the side. Secondly, it is said by one of my thoughtful German correspondents that the legs might be so obscured by the shellac as to render a study of their anatomical details a matter of difficulty, but this is not at all the case if the *legs have* had due attention paid them in the setting, and been properly extended; the middle pair would no doubt suffer in this respect, but such a trifling drawback weighs nothing against the important advantages secured by this method. Just lately I was told that the shadows cast at night time by the pins on the paper beneath were embarrassing, but this applies to all insects set high up on the pin, and surely a greater objection belongs to our present system, where these shadows are cast, not beneath, but across the insects themselves. I am quite unable to claim any economy of time for the new process, for, although the setting is facilitated, there is the mounting to do afterwards, the complete process occupying about the same time. The smaller the insects the greater the advantages of this system over the old method. In conclusion, I may say that to any one sending me a postal box I shall be most happy to return a few specimens set unpinned, and give any further information in my power. As an inducement to entomologists to give it a trial, I can say that I have never failed to set even the smallest Micro in this way. No one, I think, would guarantee to do this by pinning Nepticulas, and I am on the look-out for something more diminutive than a *Nepticula* to experiment upon. I should be thankful to any entomologist who would send me a few Diptera or any other atom, and would do my best to return them properly set.

24, Fleming Road, Lorrimore Square, S.E., June 3, 1885.

[Mr. Coverdale has been good enough to send, for my inspection, two series of Lepidoptera set without pinning, after the manner advocated by him. These consist of *Pyrales* and *Nepticulæ*, which are certainly very beautifully set and in exceptionally fine condition. This mode of setting insects (which is so original that it ought to bear the name of its inventor, and be known as "Coverdale setting") has the great advantage that there need be no loss of scales or other damage upon the side exposed to view, by the insertion of a pin through the thorax, as in ordinary setting. Entomologists are naturally conservative in their habits when considered in connection with their study of insects, whatever may be their politics. Many will resent this as an innovation because it will upset the symmetry of their collections even more than the adoption of a new list of names, or arrangement. All things are, however, regulated by market demand, and when Mr.

Coverdale's system becomes fashionable it will doubtless be so because its advocates will have had the moral courage to set their insects in the new style for the sake of the advantages it offers over our present style of setting insects by pinning them through the thorax. Some of our friends prefer to see their specimens with apices of wings touching the paper of the cabinet drawers, while others set sufficiently high to brush beneath the wings, and so keep the paper clear of dust, or the more readily to see the traces of cabinet enemies. By the Coverdale system we can have the moths close to the glass covering the drawers, and thus in a better position for observation. Another advantage is that no evil effects can occur from oxidization of the pins and the irritating "springing" of the wings in consequence. Some collectors may object to it because it will be necessary for them to take a little more pains in setting, but their correspondents might not share the same objection when receiving insects from them. Others will not like it because it will be impossible to take up an insect with the fingers, and will even require a modification of the forceps at present used for that purpose. Whatever may be the future for the Coverdale setting, it is a very remarkable innovation, and one well worth study. The examples sent are beautiful enough to tempt one to seriously think of making a new collection set after Mr. Coverdale's new fashion.—John T. Carrington.]

NOTES ON THE *AGROTIDÆ*.

By J. W. Tutt.

If your correspondent, Mr. Gardner, had given my note respecting the *Agrotis* the most cursory attention, he would not have credited me with coming to the conclusion that *Agrotis tritici* and *A. nigricans* were one and the same species. I have come to the very decided opinion, as I expressed in my previous note, that *A. obelisca* and *A. aquilina* are only divergent forms of *A. tritici;* and until they are bred from eggs I shall most likely hold the same opinion. All my remarks concerning *A. nigricans* were to show that my experience led me to believe that it was specifically distinct. I have bred a number of *nigricans*, and never seen a *tritici* among them; and in localities where

A. nigricans swarm it is, I know, impossible to find a specimen of *A. tritici*. Besides this, *A. nigricans*, except in ground colour, is so constant in markings that it required no confirmation to convince me of their actual distinctness. In cases where *A. nigricans* is mentioned as a probable form of *A. tritici*, I have doubts whether the forms obtained and called *nigricans* are really the same species we know by that name. I had no idea that anyone wished to prove that *A. segetum* and *A. tritici* are the same species; and the life-history of *A. segetum* is, I believe, fairly well known. With the latter part of Mr. Gardner's note I can quite agree; and I think he points out the exact spot where the weakness of many old records exist, *viz.*, in assuming that a large number of larvæ obtained in a place at the same time must of necessity be one species, and all insects bred from such larvæ must be forms of the same species.

I was also very pleased to see Mr. Gregson's letter taking up the other side of the question, *viz.*, the reason for considering *A. tritici*, *A. aquilina*, and *A. obelisca* specifically distinct. His letter is instructive, so far as it goes, but it proves nothing. In the first place Mr. Gregson makes a point of the different size of the larvæ. I have some specimens of undoubted *tritici* much larger than any *aquilina* or *obelisca* I have ever seen. Everyone knows that species vary in size. Is it probable that the larva which will produce a small specimen shall be the same size as one that will produce a large one? The 1¼ inch and 1½ inch test, therefore, will scarcely apply. Everyone who breeds Noctuæ of the *Agrotis* type must have noticed that we want something very much more definite than distinctness of markings and intensity of colour in determining similar larvæ. "*A. tritici* has the ends reduced." "*A. aquilina* is slightly reduced at second and last segments." These I suppose are the "ends." Hence I see no distinction here. In fact, until they are bred from eggs and not from captured larvæ, and until it has been proved that it is impossible to breed *A. aquilina* or *A. obelisca* from *tritici* eggs, and *vice versâ*, I maintain that we have no right to confuse the younger entomologists or disgust the older. New species are not so important as entomological science, and doubtful species had better be left alone, as far as lists and names are concerned, until they are no longer doubtful. With all due respect to Mr. Gregson's experience, I maintain that the illustrations of

G. obscuraria and *B. repandata* do apply (not perhaps in the exact way he puts it), and that the geographical variation must be taken into account when studying the geology of the locality of capture. What I maintain is, that in some places several shades and forms of these species may be obtained. In others, owing to peculiar circumstances, only one particular form is developed, and no other is found in the same district. I am sure many entomologists will be glad to hear of the occurrence of *A. similans* (*pyrophila*) over such a wide area; and I must congratulate Mr. Gregson on his great success in capturing this species. I have received private information of "one" having been taken in Shetland, and others a few years ago in the Isle of Portland.

I must confess Mr. Atmore's note puzzles me. I have taken some hundreds both of *tritici* and *nigricans* in many places, sometimes very commonly on the same ground, but I never saw a genuine *nigricans* in copulâ with *tritici*. I believe that in cases where it has occurred it has been unnatural. If, however, true *nigricans* copulate "freely" with *tritici*, we have another question yet to work out, which our present knowledge of these species does not touch.

I am inclined to hold the same opinion as Mr. Gregson with regard to the Shetland varieties of *A. cursoria*. All I have seen have struck me as being much more probably *A. tritici* than *A. cursoria*; but I suppose this form has not been bred from eggs.

Rayleigh Villa, Westcombe Park, Blackheath, S.E., June, 1885.

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

By Lyonell Fanshawe.

(Concluded from p. 139.)

III.—COLLECTING IN SUMMER AND AUTUMN.

In the summer months very many species may be collected by beating and sweeping trees, flowers, grass, and all descriptions of herbage. The net should be drawn lightly but thoroughly over the herbage, and with an upward motion of the hand, taking care not to entangle it in the brambles when passing. Unless it is [illegible]ned pretty frequently there will be such a confused mass of beetles, small moths, spiders, flies, petals of flowers, &c., as it will be almost impossible to separate. It is a good plan to sweep only one sort of plant at a time if possible, for by that means the food plant of the beetle can be correctly ascertained. A hayfield is a certain place for a successful hunt, especially on a sunny day in June or July, when the flowers are all in blossom. A hawthorn bush in full bloom is a well-known attraction for beetles, and indeed for all orders of insects. The net or umbrella should be held under each of the flowering boughs in turn, the boughs smartly tapped with a stick, and the net examined after each tap. Most of the species of *Meligethes* and *Epuræa*, and many others, may be easily secured in this way. Sallow blossoms, reeds, flags, rushes, fern, heather, nettles, turnips, and clover, are very productive plants, and all yield their various particular species. Many of the *Donaciæ*, *Stenidæ*, and *Chrysomelidæ*, may be taken from plants by the water in various parts of the country.

A plan by which I have captured many night-flying species is to place several open pots or basins in fields or woods, in which is some beer mixed with rum and sugar. The beetles smell the mixture, and fly or crawl to it during the night, and, when once in, few escape from the sticky compound. The drawbacks to this are that a quantity of other insects are caught, and also that the beetles become so clogged that it is sometimes rather difficult to clean and prepare them for the cabinet; nevertheless it is well worth trying. Small sticks should be placed against the outside to enable the beetles which do not fly to get in.

As the season advances sweeping may still be carried on, indeed till quite late in the autumn. Also hunting in ponds, under bark, dead leaves, moss, and the like, as many species take up their winter-quarters early, especially if the autumn be a cold one. The blossoms of ivy and privet attract many beetles, and they should be carefully examined.

September, of course, is the great month for sugaring for moths, and when the collector is searching for them on the trees he should keep a sharp look out for Coleoptera also. Many night-flying beetles are caught when "light" is being used for moths. By "sugar" and "light" many species are caught which, on account of their being night-flyers, would not otherwise be taken.

Fungi, especially when decaying, are certain to contain quantities of specimens, chiefly Brachelytra and Necrophaga; and whenever a fungus is found it should be pulled to pieces over a sheet of white paper.

The beetle hunter should never be without either a small bottle or a few pill-boxes, for, even if not out collecting, something or other will be almost certain to turn up which he wants, and, not having any means of bringing it home, he will be obliged to leave it.

An "Entomological Diary" ought to be kept regularly by every collector. It should be ruled into four or five columns, containing the date of capture, locality, number of each species caught, and any particulars worth recording. Each specimen, of course, as before stated, would have a number or mark attached corresponding to the one in the book.

I think I have now given the most important hints to enable anyone to start on this most interesting study, and only hope that these few short and imperfect notes may be the means of inducing some of the many readers of this paper to begin the fascinating occupation of beetle-hunting.

2, Halkin Street West, Belgrave Square, London, S.W., June 8, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTES FROM CORK.—Some few things which I have noted here in the past three seasons appear to be sufficiently curious to be submitted for publication. *Lycæna icarus* is said, in all the books I have read, to be double-brooded, the first brood in May and the next in August. This is true enough for England, but here there is only one appearance, that is the August one. I may say this with certainty, for in April, May and June I have carefully ransacked the localities where they abounded in August. Similarly *Cœnonympha pamphilus* is here seen only during the last half of June, and then completely disappears. This is not, I think, the effect of the failure of a brood. A strange circumstance occurred here on March 3rd last, which was an unusually fine day. A single *Pararge ægeria* was seen by me and my friends flitting about a woody roadside. This species does not hybernate, so it must have been an arrival tempted to emerge by the spell of hot weather. I think my locality is more remarkable than that of Mr. Harding, for *Melitæa aurina* (Entom. xviii. 147), as, although there was a marsh within a mile, it was in the valley beneath, and it is a matter of wonder that so weak-winged a butterfly should have scaled such a steep hill.—HARRY C. SANDFORD; Bellevue Park, Military Road, Cork.

CAPTURES IN SOUTH STAFFORDSHIRE.—Perhaps the following notes from this part of the country, during 1884, will prove interesting to your readers. On May 12th, and other days following, I found the larva of *Abraxas grossulariata* very abundant on currant and gooseberry bushes. In June I found several broods of larvæ of *Vanessa urticæ* on the stinging-nettle; also about a dozen larvæ of *Halia vernaria* (*wavaria*), feeding on a currant bush. On June 4th I visited Bewdley Forest, and found *Argynnis euphrosyne* very abundant. I captured seventeen specimens in about an hour; also one specimen of *Melitæa aurinia* (*artemis*), six *Cœnonympha pamphilus*, and two of *Venilia maculata*. I saw several *Euchloë cardamines*, one *Vanessa cardui*, and one *Gonepteryx rhamni*. I also found several cocoons of *Zygæna filipendulæ*. Rain coming suddenly on, I had to close my net and wend my way back to the town through a drenching shower. In the country around Wolverhampton during the past season, I have noticed that *Vanessa atalanta* and *V. cardui* were in great abundance, in the perfect state more so, *V. atalanta* in the larva state, during the month of August. A friend and I collected upwards of two hundred larvæ of *atalanta*, seeing besides several *V. cardui* flying, which species I saw as late as the middle of October. On August 7th I saw a remarkably fine specimen of *Macroglossa stellatarum* flying in my garden, the first specimen I ever saw in this part of the country. On August 14th I saw four *Vanessa io* in a clover field not far from Wolverhampton. I was much pleased with the sight, having never before seen one alive in these parts. During the season my friend captured twelve specimens of *Plusia iota* and three of *P. festucæ* at Ashmore Park. I noticed through the past season the following species in some plenty, *Melanippe montanata*, *Noctua triangulum*, *Plusia gamma*, *Acidalia aversata* (the banded variety being about one in three), *Hadena pisi*, *H. oleracea*, *Triphæna pronuba*, *Phlogophora meticulosa*, *Xylophasia* [illegible] The larvæ of *Pieris brassicæ* and [illegible] in August and September, and [illegible] about here. On July 13th [illegible] *Epinephele ianira* and *Cœnonympha pamphilus* in [illegible] Hill.—Thomas Hill; March [illegible] Wolverhampton.

[illegible] Birch.—Is it generally known [illegible] birch? Early in June [illegible] Mr. George Tindall of Doncaster, and I were [illegible] in the Green Farm Wood, Doncaster, Mr. Tindall found a batch of eggs on a birch leaf. [illegible] in a wild state on anything but [illegible] to what species they belonged, [illegible] Mr. Tindall's suggestion I reared them. The young larvæ [illegible] proved themselves to be a batch [illegible] we supposed the circumstance to be [illegible] whilst again collecting [illegible] the same ground, another batch of eggs [illegible] found on a birch leaf, and near it was soon [illegible] The larva of *Arctia* [illegible] high up on trees, and it is [illegible] sometimes gets "higher notions" [illegible] *villica* were plentiful, [illegible] *Cheimatobia* [illegible].—Geo. T. Porritt; Huddersfield, June [illegible]

[illegible]—In the latter part of September, 1884, I [illegible] feeding on sallow, which pupated the [illegible] spinning up in the leaves of its food-plant. [illegible] appeared on the [illegible] of June, 1885.—[illegible] June 24, 1885.

[illegible] Larvæ.—During the last few seasons Lepidoptera seem to have occurred in less numbers than of old. This year, however, I have noticed many oak trees quite bare of leaves, simply owing to the devastations of *Tortrix viridana* larvæ. When riding through some oak woods at Warley, on Saturday last, a loud cawing of rooks attracted my attention, and on looking up I witnessed a sight entirely novel in my experience. There, on the topmost branches of a fine old [illegible] whose few remaining leaves were twisted up, and doubtless contained larvæ or pupæ of Tortrices, were something like a hundred rooks, far away from their usual haunts, and hard at work on their unwonted delicacy. They took to flight at my approach, but went no further than a neighbouring oak, whence they would no doubt return soon afterwards to finish their repast. Perhaps some of your readers may have observed rooks feeding on small larvæ, but to me the sight was strange and interesting.—(Rev.) G. H. RAYNOR; Shenfield, Brentwood, June 22, 1885.

MIMÆSEOPTILUS PLAGIODACTYLUS.—Mr. Gregson has been good enough to send me a few more larvæ of this species. They came to hand June 5th; all were then full fed, some of them, in fact, just on the point of pupating. As on former occasions, when sending me larvæ of *M. plagiodactylus*, Mr. Gregson called my attention to the absence of "claret-coloured dorsal stripe." Hitherto I have failed to agree with Mr. Gregson in this matter, but examination of this last batch has conclusively proved the absence of dorsal markings of any shade of either red or brown. Although there was no trace of such markings on the larvæ up to almost the last moment of their active existence, I observed that shortly after they had taken up their position to effect their pupal transformation, a slight rosy suffusion of the anal segment occurs, and that each pupa developed the pink or rose-coloured dorsal markings more or less strongly. One pupa under notice at the present moment is suffused over the whole dorsal area with rose madder. Up to the time of penning this note two imagines have emerged, and they are undoubtedly fine strongly marked *M. plagiodactylus*, or perhaps it would be more correct to write *bipunctidactyla*. I should add that the individuals of this, the third consignment of *M. plagiodactylus* larvæ from Mr. Gregson, differ only from those of the first and second batches sent me by the same gentleman in the matter of dorsal ornamentation; in all other respects they are identical.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, N.W.; June 20, 1885.

PLATYPTILIA GONODACTYLA. — I did not, when I wrote the note published in last month's issue, know that Mr. Gregson had bred the larva he mentioned as feeding on the undersides of the leaves of *Tussilago farfara*, and which he supposed might be *Pterophorus farfara*, and until I read Mr. South's note last week I was under the impression he had not. Did Mr. Gregson describe the larva which he reared? If so, did it agree with the continental descriptions of *P. farfara* larvæ? or did it materially differ from *P. gonodactyla* larva of the first brood? If it agreed with *P. farfara*, and did not materially differ from *P. gonodactyla*, it would go a long way to bearing out Mr. South's suggestion that it may be a "seasonal form" of *P. gonodactyla*, or in other words that it is to be referred to the second brood of *P. gonodactyla*, for such I take this phrase to mean. Again, have the continental authorities noted *P. gonodactyla* as double-brooded? and does *P. farfara*, of Zeller, appear on the Continent in the same places as *P. gonodactyla*, and at a time corresponding with a second brood of that species?—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., June 9, 1885.

FOSSIL INSECTS.—At a meeting of the Geologists' Association, held at University College on the 5th of June last, Mr. Herbert Goss, F.L.S., F.G.S., read a paper "On some recently discovered Insecta and Arachnida from Carboniferous and Silurian Rocks." After remarking on the great number of Palæozoic insects lately discovered, and calling attention to the recent investigations and writings on the subject of M. Chas. Brongniart, Dr. Deichmüller, Dr. Dohrn, Dr. Fritsch, Dr. Eugen Geinitz, Dr. H. B. Geinitz, Dr. Goldenberg, Dr. Hagen, Prof. Lindström, Dr. Novak, Mr. B. N. Peach, Mr. Scudder, and Dr. Sterzel, the author stated that at the date of his last paper in March, 1879, only 103 fossil insects from the Carboniferous rocks of the whole world were known; but that during the last five years a large number had been discovered, including about 1400 from the Coal-measures of Commentry, France, and a few from Saarbrück, Kleinopitz, Lugan and elsewhere in Germany, and a considerable number from various parts of the North American continent. Such of the specimens as had yet been determined were then enumerated, some of the most remarkable forms were referred to in detail, and attention was drawn to their affinities with existing types. According to M. Brongniart, the Commentry fossils included about forty types. The Hemiptera are represented by genera allied to *Fulgora*, *Lystra* and *Membracis;* the Neuroptera by forms approaching *Corydalis*, *Chauliodes* and *Hemerobius;* the Pseudo-Neuroptera by types closely allied to *Ephemera* and *Perla;* and the Orthoptera by *Blattidæ* and *Phasmidæ*. Many of these fossils, could not, however, be referred to any existing order, but belonged to some synthetic or homogeneous types uniting in themselves characteristics of Neuroptera and Orthoptera, or Neuroptera and Hemiptera, proving that at this early period the differentiation of many of the existing groups was not completed. Attention was then called to the discovery last year of fossil scorpions (insectivorous animals) in the Upper Silurian of the Isle of Gothland and Scotland, and of the wing of a cockroach in the middle Silurian of Jurques, Calvados, France. Prior to these discoveries no remains of terrestrial animals had been discovered from any strata older than the Devonian, and the result of the discovery of this cockroach in Silurian strata was to leave the insects the oldest known class of land animals, and the *Blattidæ* the oldest known family of insects. The paper concluded with a summary of the results of recent discoveries, and it was stated that the evidence afforded by Palæontology was, as far as it went, in support of the views as to the origin of insects and the order of succession on the earth of the various groups arrived at by Dr. Packard and others from a study of the embryology of the class. No evidence had, however, yet been obtained of the existence of any earlier forms connecting the Insecta with those lower groups from which they are, by many biologists, believed to have originated.

ENTOMOLOGICAL COLLECTIONS AT THE U.S. NATIONAL MUSEUM.—We understand that Prof. Baird, Director of the U.S. National Museum, has decided to appoint an assistant Curator of the Department of Insects in that Museum, at a salary of 1500 dollars per annum, and that Prof. Riley, the honorary curator, in view of the fact that this action will secure the permanent care of collections, in case of his death or removal from Washington, has decided to turn over to the Museum all his own collections, the larger part of which are already deposited in the Museum. It may be of some interest to learn how much of a collection the National Museum can at present boast of. From data kindly furnished by Prof. Riley, the following has been compiled. 1st. Collection C. V. Riley, 17,725 species with 115,058 specimens, divided as follows:—Hymenoptera 2550 species, 24,796 spec.; Coleoptera 9058 species, 48,618 spec.; Diptera 699 species, 5646 spec.; Lepidoptera 2368 species, 17,098 spec.; Hemiptera, 1134 species, 8862 spec.; Orthoptera, 560 species, 6903 spec.; Neuroptera, 160 species, 868 spec.;

Arachnidæ and Myriapoda 110 species, 425 spec.; Galls and Gall insects, 734 species, 4152 specimens; the balance miscellaneous and Insect Architecture. There is also an alcoholic collection, principally of adolescent states, containing 2850 vials, and a collection of some 3000 slides of minute insects and larvæ mounted in Canada balsam. 2nd. Collection of Department of Agriculture. Containing a large lot of material accumulated in the practical work of the division, and by the collection of its employées. It contains about 5000 species—mostly exotic—not in the Riley collection. 3rd. Collection of the National Museum. This is the poorest of the lot, and consists principally of the material sent in during the past three years from all sources. There are about 2000 species not in either of the other collections. 4th. The exhibit collection of Economic Entomology prepared for the New Orleans Exhibition, valuable for its economical interest. A catalogue of this has been printed. This forms a good nucleus, and in charge of a competent and enterprising curator it will quickly take rank as one of the most important in the country. The large collection of larvæ forms a distinct and decided addition to its value.—'*Entomologica Americana*,' June, 1885.

REVIEWS.

Entomologica Americana. Vol. I., No. 1. Brooklyn, N. Y. April, 1885.

This, the newest of entomological serials, is to be the organ of the Brooklyn Entomological Society, and absorbs the 'Bulletin' of that Society and 'Papilio,' both being discontinued in favour of this monthly magazine, which is to be edited by Mr. John B. Smith, with the assistance of a publication committee of four other members. We also gather that Prof. C. V. Riley, the U. S. Entomologist, is giving his support; so that "a future" may be expected for 'Entomologica Americana,' notwithstanding its inconvenient title.

Among the more important articles in the first number is one headed, "Synonymical Notes," by Dr. George H. Horn, who [illegible] his subject certain species of Coleoptera, described by

Edward Newman, more especially the Cerambycidæ. The critical examination of the different species and their synonyms is carefully worked out, priority being rigidly maintained, and names of "long-continued use" being ruthlessly sacrificed. The species dealt with were described in 1838 ('Entomological Magazine,' vol. v.), 1840–2 ('Entomologist,' vol. i.), the 'Zoologist,' and in 'Charlesworth's Magazine.' Newman's names seem to be still accepted in the majority of instances. Dr. S. W. Williston has a technical paper on the classification of the Diptera of America; but the article of most interest to English readers is one by Mr. John B. Smith, on "Noctuids common to England and North America." This paper is a criticism of one which appeared in the 'Verh. K. k. zool. bot. Gesellschaft in Wien' last year, by H. B. Mœschler, upon the same subject. Mr. Smith deals with the genus *Agrotis* of Staudinger more particularly; and we find, among others, common to America and Europe, several of our old British friends, such as *augur*, *festiva* var. *conflua*, and *segetum*. Mr. Smith doubts the identity of these with the American representatives; but he agrees with the eleven other species of the genus common to both continents, among which we find *baia*, *c-nigrum*, *plecta*, *fennica*, *saucia*, *upsilon*, and *occulta*.

This subject of distribution of species is of great interest, as showing to what extent species may become changed or modified when long separated in far distant localities, and to what extent the so-called species of American insects are really good species, or only sub-species of previously known insects in the "Old World."—J. T. C.

Elementary Text-book of Entomology. By W. F. Kirby. Large square 8vo, with 87 plates and 650 figures. London: Swan Sonnenschein & Co. 1885.

This work again takes us over paths already trodden, but makes them more interesting by illustration. The letterpress extends to 240 pages, including an introduction. Though most of our readers will be familiar with the subjects treated in the introduction, these will bear re-reading; and many will find both instruction and amusement in perusing the dozen or so pages devoted to that section of the work. The more recent discoveries in the habits of insects are recorded, and the facts are pretty well up to time. It is interesting to know that Mr. Kirby estimates the number of species of insects of all orders, as yet identified throughout the world, at 220,000, out of which about 12,000 are known to inhabit England.

> "Nor let anyone imagine that our British Fauna is by any means exhausted. It is true that the British Coleoptera and Lepidoptera have been so far investigated that a man must work very hard before he can hope to add a new British species to either order; but any entomologist who cares to take up any of the less studied groups of any of the other orders may rely on adding a considerable number of new species to the British Fauna, a certain proportion of which will be new to Science. Even among our commonest insects the habits and structure of any one species would furnish any person, with a taste for such pursuits, with sufficient employment for a lifetime. The collectors province may be exhausted in a few years; but the observers, never."

The treatment of the separate orders in the body of the work is concisely managed, and generally satisfactory. The plates are sufficient for the purpose for which they are required, though by no means up to the standard of modern work. If a portion of the illustrations had been devoted to the characteristic anatomy of the various orders, it would have added to the scientific value of the work; and had the figures of the Lepidoptera been favoured more generally with legs as well as wings, we should have thought them more representative.—J. T. C.

OBITUARY.

The late Mr. THOMAS COOKE was among the best known entomologists of the past generation. He was born in 1814; and founded the well known natural-history agency now in Museum St., London, in 1853. His genial temperament had made him many friends; but latterly he had of necessity retired from active life from the affliction of paralysis, with which he was stricken more than eight years ago, and since then he has been confined to his bed. He died on the 10th of June, 1885. Mr. Cooke has not, that we are aware, added much to the written history of insects. He was a member of the Haggerston and West London Entomological Societies.

THE ENTOMOLOGIST.

VOL. XVIII.] AUGUST, 1885. [No. 267.

NOTES FROM EPPING FOREST.

BY GEORGE V. ELSTOWE.

THERE is nothing so disheartening to the young collector than a continuous east wind, rendering most species scarce upon the wing, and generally those he is most in want of for the formation of his young collection. Such were my feelings on a temporary stay at Loughton, during which I spent considerable time in the adjoining Forest, with the intention of adding to my collection several good species, generally looked upon as easily procurable there, and of finishing my series of many common things.

I had noticed in the 'Entomologist' (Entom. xviii. 88) that Mr. Wright—who appears to have worked that part considerably —gave reasons for expecting a better show of Lepidoptera during this spring and summer than has been seen for some seasons back; and, taking the result of my collecting altogether, I must admit that, to a certain extent, his arguments have been in the main verified. However, I found the cold winds of May and June very tantalizing; and although during the day the sun shone warmly, the temperature after sunset fell considerably, owing to the prevailing direction of the wind. Although few things appeared in flight, yet I made up in a small measure during early May by diligent searching, both in the daytime and evening, and was rewarded by finding several good *Anticlea badiata* and *A. nigrofasciaria* (*derivata*), both apparently late in appearing, as their good condition indicated. I also noticed that almost every species this year has been backward, and has continued so almost up to the present. This I found especially with regard to those species due to appear at the end of May and in early June.

During the second week in June *Drepana cultraria* (*unguicula*) was out in fair numbers, although it required considerable bough-beating to obtain a satisfactory series; and at the same time *Zonosoma linearia* (*trilinearia*) and *Nola confusalis* (*cristulalis*). I was very pleased to see numbers of *Z. punctaria*, very little labour being required to obtain a satisfactory series from the pollard oaks round the Old Roman Encampment. Also *Odontopera bidentata*, which appears to brave any weather. *Drepana falcataria* (*falcula*) and *D. lacertinaria* (*lacertula*) were visible; the former about Epping Thicks sparingly, and the latter at High Beech somewhat more liberally. Also *Macroglossa fuciformis* round a cultivated patch of garden; and whilst working the birches round Epping Thicks I was very pleased to take seven *Sesia culiciformis*, and also saw the tunnels of probably *Trochilium carbroniformis* (*bembeciformis*), although of this latter I am not quite sure, as I understand there is a beetle which burrows in sallows in much the same way as *T. carbroniformis;* I did not succeed in obtaining either pupa or imago of it. I also took *Acronycta leporina,* which I believe is a rarity. This last-mentioned locality seems a promising one for future working, the trees having been thinned considerably; but the recent felling, however much it may be regretted in other ways, will allow of a richer growth on the ground, permit the trees to expand, and facilitate locomotion.

In conversation with other collectors whom I met I learn that considerable disapproval is rife regarding the large numbers of trees being felled in this and other parts of the Forest, but it is my opinion that it is but sacrificing the present for the future, and that in a few years this part especially will well repay a visit. In fact, this locality repaid me better than any other I worked, as I was successful in finding there *Stauropus fagi*, and some weeks before a like number of *Asphalia flavicornis*. The first *S. fagi* which I found struck me as presenting an odd figure, although I daresay the peculiarity has often been observed before, *viz.*, that when at rest upon the tree trunk it pushes its hind legs underneath and in front of the fore ones. While beating the oaks for *Zonosoma punctaria* round by the Roman Camp I was surprised and pleased to net *Drepana binaria* (*hamula*), and it was not long before I had a good series. I observed several cripples of this species on the tree trunks and on the grass, and it struck me as peculiar that it was usually the left hind wing that was either incomplete or totally wanting.

On the beech trees adjoining I obtained a few *Eurymene dolobraria*, and *Dasychira pudibunda* in couples were not wanting, although apparently very late, having observed one as recently as July 3rd. During May I took one *Amphydasis strataria* (*prodromaria*) and several *A. betularia*; also *Lophopteryx camelina*, and, in goodly numbers, *Hylophila prasinana*, the former on the trunks and the latter clinging to the leaves of the oaks bordering on the plain at Theydon. I was also surprised to find *Erastria venustula* in greater numbers than I had expected, having no difficulty in obtaining a good and well-marked series in two evenings at the latter end of June. This moth, I understood from a local collector, who considered it a good species, was to be had but sparingly, and although I failed to find the spot indicated by him, yet I was not disappointed while working for it about half way between Theydon Bois and Loughton. It, however, is not one of the easiest species to capture, as it requires close watching and a quick hand, as its flight is quick and short. I also succeeded in obtaining some ova, which hatched in eighteen days, and the larva now strongly resembles that of a small sawfly, rolling itself into a flat compact ring when disturbed. I have endeavoured to get them to eat various wild flowers, but find that they will only touch those of blackberry and *Tormentilla reptans*, which, I am inclined to believe, is the true food-plant.

At the same time and place I found *Numeria pulveraria*, although not in any numbers, and while working round the crab trees near Theydon I obtained several *Eupithecia rectangulata*, among which were two very dark varieties, in fact almost black, and very different from the beautiful dull green of those which I took in the New Forest the year before.

As June drew on the weather showed signs of improvement, and until the last week, when the east wind returned, I succeeded in taking no less than thirty-seven species, many of course common, but some worthy of mention:—*Melanippe procellata*, *M. sociata* (*subtristata*), *Emmelesia albulata;* and at sugar two *Dicycla oo;* also *Thyatira batis, T. derasa,* and *Cymatophora duplaris;* and as July drew on, *Dipterygia scabriuscula* (*pinastri*); and among those to be mentioned as numerous were *Noctua augur, N. festiva,* and *Aplecta nebulosa.* Among the Geometræ were *Emmelesia decolorata* (near Ongar), *Larentia didymata, Pericallia syringaria* (although small), and *P. pustulata* (*bajularia*).

Among larvæ I did not do much; being only a temporary resident, I found it difficult to devote the time and space for their occasional feeding. However, I noticed several worth mentioning, especially towards Ongar; in a small wood I found three *Notodonta chaonia,* two *N. trimacula* (*dodonea*), and a few *Euchelia jacobeæ,* although the latter I observe, in a recently published guide to the Forest, is mentioned as scarce.

During my rambles in the daytime I noticed a fair number of species belonging to the Diurni, but could not help remarking that many of them were very restricted in locality. *Argynnis euphrosyne* I found plentiful in two places, but away from those I did not see it; the same may be said of *A. selene. Lycæna argiolus,* at the north side of Epping Thicks, where the holly is very prolific, was occasionally to be met with; and also *Pararge megæra,* but sparsely. In the low-lying districts *Nisoniades tages* and *Syrichthus alveolus* were plentiful; but beyond one *Colias edusa* I saw scarcely anything but the common whites. *Thecla quercus* larvæ, although plentiful at oak near Theydon, did not appear in any numbers on the wing; and of *T. betulæ* I found a great difficulty in obtaining a few larvæ; but as I hear that it is sometimes plentiful, I conclude that this is a year of a scarcity.

The foregoing, although not exhaustive, will therefore show that species generally could not be considered as very plentiful, yet there was sufficient to repay a diligent collector; and, properly worked by anyone living in the neighbourhood, I feel sure that a splendid nucleus for a good collection might be obtained from the Forest alone; and, doubtless, through want of a better knowledge of the localities, I failed to get many of the good things which it contains.

July 27, 1885.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. V.—OPHIONIDÆ (*continued*).

C. Abdomen red and black; scape pale (red or yellow) beneath.
A. Hind femora red, or greater part so.
a. Hind tibiæ red, or apex dark.
* Hind coxæ red, aculeus rather less than half of abdomen (male and female).
† Post-petiole transverse or subtransverse. - *litoralis*, 2—2½ lines.
†† Post-petiole elongate or subquadrate.
Head behind the eyes dilated; hind coxæ generally fusco-maculated. - - - - 38. *hydropota*, 1½—2 lines.
Head behind the eyes not dilated; coxæ entirely red.
63. *rufiventris*, 2—2½ lines.
** Hind coxæ partly red.
‡ Aculeus of female short, base of antennæ reddish.
ruficornis, 2—2½ lines.
‡‡ Aculeus of female rather less than half of abdomen.
§ Post-petiole longer than wide, or subquadrate (male and female).
38. *hydropota*, 1½—2 lines.
§§ Post-petiole transverse or subtransverse (female).
litoralis, 2—2½ lines.
*** Hind coxæ black; aculeus short.
o Abdomen red, base black. - - 56. *paludicola*, 2—2¼ lines.
oo Middle of abdomen red. - - - 45. *longipes*, 2—2¼ lines.
ooo Incision of two sides of 3rd and belly of 4th to 6th segments red.
erythropyga, 2—2½ lines.
oooo Apex of segments 2nd to 4th red; 5th red; base of back black; 6th and 7th towards the belly red. - 5. *alternans*, 2 lines.
b. Apex and before the base of hind tibiæ more or less dark.
* Aculeus of female about half of abdomen.
† Margin of 3rd to 7th segments and sides pale.
50. *multicincta*, 2—2½ lines.
†† Segments 3rd to 6th chestnut, with black dorsal marks.
46. *maculata*, 3 lines.
** Aculeus rather less than 1st segment of abdomen.
More or less of apex of 1st, 2nd, and 3rd segments red.
barrettii, 3 lines.
*** Aculeus very short.
‡ Head buccated; sides of abdomen sometimes red-marked (male and female). - - - - *clandestina*, 2¼—3 lines.
‡‡ Head narrow behind the eyes; 3rd to 7th segments partly red; extreme base of hind tibiæ yellowish (male and female).
9. *argentata*, 2½—2¾ lines.
c. Base and apex of hind tibiæ dark.
* Head narrow behind the eyes; aculeus of female very short.
† Hinder coxæ black.
‡ Front coxæ reddish yellow.
§ 1st, 2nd, and 3rd segments red-margined. - *tricincta*, 3 lines.

§§ 2nd and 3rd segments red-margined. 13. *bicingulata*, 2—2⅓ lines.

‡‡ Front coxæ black.

Female apex of 2nd segment, male apex of 2nd and 3rd, red; the red more or less obsolete sometimes. 21. *crassiuscula*, 2⅓ lines.

†† Hinder coxæ red. - - - - - 71. *unicincta*, 3 lines.

**** Head buccated. - - - - - *erythropyga*, var.**

***B*. Hind femora black.**

a. Aculeus of female about as long as 1st segment.

Scape beneath red; abdomen red; petiole, 2nd to 7th or 4th to 7th segments with dark dorsal marks, or abdomen almost entirely red; hind tibiæ black, middle testaceous, base whitish.
48. *melanosticta*, 2 lines.

b. Aculeus very short; middle of abdomen more or less red; apex of hind tibiæ fuscous.

*** Claws of hind tarsi pectinated at the base; sides of head behind the eyes parallel; teeth of mandibles unequal.**
35. *fulviventris*, 2—2½ lines.

**** Claws of hind tarsi distinctly pectinated; sides of head somewhat slanting; teeth of mandibles subequal. *pagana*, 1⅓—2¼ lines.**

D. Abdomen red and black; scape black beneath.

A. Hind femora red.

a. Hind tibiæ red, or apex more or less dark.

* Hind coxæ red.

Aculeus longer than 1st segment; middle of abdomen red; head subbuccated. - - - - - *litoralis*, 2—2½ lines.

** Hind coxæ fusco-maculated.

Middle of abdomen red, head much buccated; aculeus less than half of abdomen. - - - 38. *hydropota*, 1⅓—2 lines.

*** Hind coxæ black.

† Front coxæ pale.

Middle of abdomen red (see above); stigma pale. 38. ***hydropota***, var.

‡ Aculeus of female one-third of abdomen; stigma fuscous.
rufata, 2—2¼ lines.

‡‡ Aculeus of female very short. - - 43. ***insidiator***, 2⅓ lines.

†† Front coxæ black; in the male of ***rapax*** more or less red.

§ Aculeus short.

o Aculeus hidden. - - - - - ***canaliculata***, 2⅓ lines.

oo Aculeus projecting.

× Extreme base of hind tibiæ whitish. 54. ***notata***, 2⅓—3½ lines.

× × Base of hind tibiæ not whitish; aculeus rather longer than *notata*.
59. *rapax*, 2½—2¾ lines.

§§ Aculeus about as long as the 1st segment of abdomen.

+ 2nd segment of abdomen transverse. 15. *brevicornis*, 3—3½ lines.

+ + 2nd segment of abdomen not transverse.

++ Aculeus longer than the 1st segment. 20. *crassicornis*, 2¾—4 lines.

++++ Aculeus less than the 1st segment. - 6. *alticola*, 2¾ lines.

Males only.

3rd segment red, base black; 4th, apex and sides red; 2nd segment more than twice as long as wide.
17. ***carnifex***, 2½—3⅓ lines.

Abdomen red; petiole only black. - - - *rufa*, 4 lines.

b. Base and apex of hind tibiæ dark.

* Front coxæ more or less pale.

† Sides of segments reddish chestnut; aculeus rather longer than 1st segment; middle of hind tibiæ white.

assimilis, nearly 3 lines.

†† Middle of abdomen red. (See above.) - - 59. *rapax*, var.

** All the coxæ black.

‡ 3rd segment and sides of rest chestnut; middle of hind tibiæ red; aculeus very short. - - - - *cædator*, 2—2½ lines.

‡‡ Middle of abdomen red.

§ Head behind the eyes not narrow.

Aculeus very short; middle of hind tibiæ red.

12. *auctor*, 3½—4 lines.

§§ Head behind the eyes narrow; aculeus very short.

24. *dolosa*, 3—3½ lines.

c. Apex and before the base of hind tibiæ dark.

* Middle of hind tibiæ whitish.

† Extreme apical margin of segments reddish yellow; aculeus about half of 1st segment. - - - *concinna*, 5 5·5 mm.

†† Middle of abdomen red; aculeus short. 60. *ruficincta*, 2⅓—3½ lines.

††† Sides of abdomen red; aculeus about half of abdomen.

Transverse anal nervure slightly geniculated.

26. *ensator*, 2⅓—3 lines.

** Middle of hind tibiæ reddish. - 54. *notata*, 2⅓—3½ lines.

B. Hind femora dark.

a. Hind tibiæ red, or apex dark.

Aculeus short. (See below.) - - - 40. *incrassata*, var.

b. Base and apex of hind tibiæ dark: aculeus short (male and female).

* Head behind the eyes much wider at the back part than against the eyes.

Middle segments red-margined. - - *monticolana*, 2½ lines.

** Head not thus widened; middle of abdomen red, more or less black-marked.

† Antennæ half the length of body; hind tarsi with short pectinations. - - - - 40. *incrassata*, 2½—3 lines.

†† Antennæ two-thirds the length of body; hind tarsi distinctly pectinated. - - - - - 12. *auctor*, 3½—4 lines.

c. Apex and before the base of hind tibiæ dark.

Sides of segments red-marked, sometimes the margins also, sometimes almost entirely black; aculeus longer than 1st segment of abdomen.

* Aculeus of female half of abdomen (female).

70. *tumidula*, 2—2½ lines.

** Aculeus of female one-third of abdomen (male and female).

31. *femoralis*, 2½—2⅔ lines.

d. Hind tibiæ almost entirely dark.

* Base of hind tibiæ white; aculeus very short. 49. *mæsta*, 3 lines.

** Base of hind tibiæ not white, middle sometimes reddish.

61. *rufimana*, 3—4 lines.

THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

(Continued from p. 183).

NOCTUÆ.

Bryophila perla, Burton (E. B., W. G., and J. T. H.), Branston (J. E. N.), not common at Bretby (T. G.), common at Derby (G. B.), near Ashbourne (H. F. G.), common at Rugeley (R. F.).

Demas coryli, Dovedale (G. B.).

Acronycta tridens, common (E. B.), fairly common at Burton (G. B.), Barrow (G. A. S.). *A. psi*, common throughout the district. *A. leporina*, one near Willington (W. G.), Burton (P. B. M.), Stapenhill (G. B.), Ashby (G. A. S.). *A. megacephala*, tolerably common where poplars are found. *A. alni*, one at Knightley Park (E. B.), two larvæ taken (W. G.), one at Burton (C. F. T.), Stapenhill (G. B.), Eggington (Arthur Marshall), one in Repton Shrubs (J. E. N.), one in Hoofies Wood, near Hartshorne (T. G.), Ashby (G. A. S.). *A. ligustri*, Repton Shrubs, rare (E. B.). *A. rumicis*, common (E. B.), Derby (G. B.), Barrow (G. A. S.), common on Cannock Chase (C. F. T.).

Diloba cæruleocephala, common throughout the district.

Leucania conigera, The Lawns (E. B.), one larva (G. B.), Burton (J. E. N.), one at Bretby (T. G.), Barrow (G. A. S.), common at Rugeley (R. F.). *L. lithargyria*, Burton (E. B., G. B., J. E. N., and W. G.), Barrow (G. A. S.), one at Bretby (T. G.). *L. comma*, Henhurst, &c. (E. B. and W. G.), Burton (J. E. N. and G. B.), Bretby (T. G.), Barrow (G. A. S.), near Derby (H. F. G.), at light, at Rugeley (R. F.). *L. impura* and *L. pallens*, common throughout the district.

Cœnobia rufa (*despecta*), Henhurst (E. B.).

Tapinostola fulva, common (E. B. and W. G.), Burton (G. B.), Bagots Park (C. F. T.), Bretby, 1881 (T. G.).

Nonagria arundinis (*typhæ*), common throughout the district. *N. lutosa*, Willington (E. B.).

Gortyna ochracea (*flavago*), common throughout the district.

Hydrœcia nictitans, Henhurst (E. B.), Burton (G. B.), Bretby (T. G.), Rugeley, at light (R. F.). *H. micacea*, Burton, common (E. B. and W. G.), Burton, at light (C. F. T., &c.), one at Bretby (T. G.), Barrow (G. A. S.).

Axylia putris, common throughout the district.

Xylophasia rurea, common throughout the district. *X. lithoxylea*, The Oaks (E. B.), common on lime blossoms at Burton (C. F. T.), Burton (G. B.), Bretby (T. G.), near Derby (H. F. G.), Barrow (G. A. S.), Rugeley, common (R. F.). *X. sublustris* (?), one at Willington (W. G.). *glypha* (*polyodon*), common throughout the district. *X. hepatica*, Henhurst, common (E. B. and W. G.), Burton (G. B.), Bretby (T. G.), Barrow (G. A. S.). *X. scolopacina*, Knightley and Bretby (E. B.), near Ingleby (W. G.), once at Shobnall (J. E. N.).

Neuria reticulata, Henhurst and Repton Shrubs (E. B.), once at Barrow (G. A. S.).

Neuronia popularis, Burton (E. B. and W. G.), twice at Bretby (T. G.), very common at Derby (G. B.), Rugeley (R. F.).

Charæas graminis, Bretby (E. B., T. G., and W. G.), Derby (G. B.), Cannock Chase, common (J. E. N. and R. F.), Charnwood Forest (J. T. H.).

Cerigo matura (*cytherea*), Knightley (E. B,), one at Barrow (G. A. S.).

Luperina testacea, Henhurst (E. B. and W. G.), Burton and Derby (G. B.), one at light, at Burton (J. E. N. and C. F. T.).

Mamestra anceps, Burton, at sugar (G. B.), Bretby, at sugar (T. G.), Barrow (G. A. S.). *M. brassicæ*, common throughout the district. *M. persicariæ*, near Derby (E. B.), common at Derby (G. B. and H. F. G.), once at Burton (W. M. A.), common at Rugeley (R. F.).

Apamea basilinea and *A. gemina*, common throughout the district. *A. unanimis*, common at Burton (G. B.). *A. didyma* (*oculea*), common throughout the district.

Miana strigilis and *M. fasciuncula*, common throughout the district. *M. literosa*, Willington (W. G.), Derby (G. B.), Barrow (G. A. S.). *M. arcuosa*, Henhurst (E. B. and W. G.), Bretby (T. G.), Repton Shrubs (G. B.).

Grammesia trigrammica (*trilinea*), common (E. B. and W. G.), Burton (J. E. N. and G. B.), Derby (G. B.), Bretby (T. G.), Barrow (G. A. S.), Ashborne (H. F. G.) Variety *bilinea*, Derby (G. B.).

Stilbia anomala (?), one at Findern (W. G.).

Caradrina morpheus, common throughout the district. *C. alsines*, Barrow (G. A. S.). *C. taraxaci* (*blanda*), Derby (G. B.), Barrow (G. A. S.). *C. quadripunctata* (*cubicularis*), common throughout the district.

Rusina tenebrosa, one in Repton Shrubs (W. G.), Cannock Chase, common (T. G.).

Agrotis suffusa, common some years. *A. saucia*, Somershall, rare (E. B.), one near Willington (W. G.), Burton, at sugar (C. F. T.). *A. segetum* and *A. exclamationis*, common throughout the district. *A. nigricans*, Derby (G. B.), Barrow (G. A. S.), two at Bretby, 1884 (T. G.). *A. tritici*, Barrow (G. A. S.). *A. aquilina*, The Lawns (E. B.), one specimen (W. G.), once at Bretby (T. G.). *A. obelisca*, bred from larvæ taken at Derby (G. B.). *A. agathina*, Breadsall Moors (G. B.). *A. strigula* (*porphyrea*), Cannock Chase (C. F. T.), Breadsall Moors (G. B.). *A. obscura* (*ravida*), Burton, rare (E. B.), Barrow (G. A. S.). *A. simulans* (*pyrophila*), Somershall, rare (E. B.).

Noctua augur, common throughout the district. Variety *helvetina*, has occurred near Derby (G. B.). *N. plecta* and *N. c-nigrum*, common throughout the district. *N. triangulum*, Henhurst (E. B. and W. G.), once at Bretby (T. G.), larvæ common in spring (G. B.). *N. brunnea*, Henhurst (E. B.), Willington (W. G.), Burton (C. F. T.), Little Eaton, common (J. E. N.), one at Bretby (T. G.), larvæ found in spring (G. B.). *N. festiva*, common throughout the district. *N. subrosea*, once at Little Eaton (G. B.). *N. rubi*, common throughout the district. *N. umbrosa*, larvæ on seeds of wild hyacinth (W. G.), at sugar, at Burton (C. F. T. and J. T. H.), Bretby, common (T. G.), Barrow (G. A. S.), Little Eaton (H. F. G.). *N. baia*, The Oaks and Henhurst (E. B. and W. G.), Bretby, at sugar (T. G.), once at Barrow (G. A. S.). *N. xanthographa*, common throughout the district.

Triphæna ianthina, Henhurst (E. B.), Burton (G. B.), fairly common at Bretby (T. G.), Barrow (G. A. S.), fairly common at Rugeley (R. F.), frequently flying by day (W. G.). *T. fimbria*, Henhurst (E. B.), Willington (W. G.), larvæ at Waterloo Clump, Repton Shrubs, and Tatenhill (G. B.), occasionally at Bretby (T. G.), Little Eaton (H. F. G.), Rugeley, but rare (R. F.). *T. interjecta*, Willington (E. B.), scarce (W. G.), Burton (G. B.), Barrow (G. A. S.), Rugeley, but rare (R. F.). *T. comes* (*orbona*) and *T. pronuba*, common throughout the district.

Amphipyra pyramidea, Burton (E. B. and J. T. H.), Repton (W. G.). *A. tragopogonis*, common throughout the district.

Mania typica and *M. maura*, common throughout the district.

Panolis piniperda, one at Knightley Park (J. T. H.).

Pachnobia rubricosa, Burton churchyard (C. F. T.), Bretby (T. G.), Repton Shrubs (J. E. N.), Little Eaton, common (G. B.). *P. gothica* and *P. incerta* (*instabilis*), common throughout the district. *P. populeti*, Henhurst (E. B.), near Branston (J. T. H. and J. E. N.), near Brizlingcote (G. B.), Bretby, common (T. G.), one pupa in Bretby Park (C. F. T.), Barrow (G. A. S.). *P. stabilis*, common throughout the district. *P. gracilis*, Burton, but rare (E. B.), Willington (W. G.), Branstone, osier-beds (C. F. T.), near Branstone (J. T. H.), Derby and Little Eaton (G. B.). *P. munda*, Henhurst (E. B. and C. F. T.), Repton (W. G. and C. F. T.). *P. pulverulenta* (*cruda*), common throughout the district.

Orthosia upsilon, common in the larva state. *O. lota*, Henhurst (E. B. and W. G.), Burton, at sugar (C. F. T.), Drakelow (J. T. H.), Repton (G. B.), one at Bretby (T. G.).

Anchocelis rufina, Henhurst, common (E. B.). *A. pistacina*, common throughout the district. *A. lunosa*, Barrow (G. A. S.). *A. litura*, fairly common throughout the district. *A. vaccinii*, Henhurst, very common (E. B.), Willington (W. G.), Henhurst (C. F. T.), Bretby (T. G.), Derby (G. B.), Ashborne (H. F. G.). *A. spadicea*, Henhurst, common (E. B.), formerly at Burton (J. T. H.), Willington (W. G.), Derby (G. B.), (G. A. S.).

Scopelosoma satellitia, common throughout the district.

Xanthia citrago, near Repton (W. G.), Bretby Park and Repton Shrubs (G. B.). *X. fulvago*, common throughout the district. Variety *flavescens*, occurs occasionally throughout the district. *X. flavago*, common throughout the district. *X. gilvago*, Burton and Derby (E. B. and W. G.), Derby, very common (G. B.), Barrow and Findern (G. A. S.). *X. circellaris* (*ferruginea*), common throughout the district.

Cirrhœdia xerampelina, Repton, Willington, and Burton (E. B.), one near Willington (W. G.), larvæ common at Barrow (G. A. S.), larvæ at Burton and Willington (C. F. T.), common at Derby (G. B.), Dovedale (J. T. H.).

Tethea subtusa, Henhurst (E. B.), Barrow (G. A. S.), Bretby (T. G.), larva at Bretby (C. F. T.), common among poplars (G. B.).

Calymnia trapezina, common throughout the district. *C. diffinis*, Burton (E. B.), Etwall (W. G.). *C. affinis*, Burton (J. E. N.), Derby (G. B.), Barrow (G. A. S.), one at Bretby (T. G.).

Dianthœcia capsincola, Burton (E. B. and W. G.), Shobnall (J. E. N.), Barrow (G. A. S.), common in larva state (G. B.). *D. cucubali*, Burton (E. B., G. B., J. T. H.), common at Burton (C. F. T.). *D. carpophaga*, Shobnall (E. B.), Burton (C. F. T.), Bretby, common (G. B.).

Polia chi, Burton (E. B. and W. G.), Barrow (G. A. S.), Little Eaton, common (G. B.), near Ashborne (H. F. G.), Rugely (R. F.). *P. flavicincta*, once at Derby (G. B.).

Dasypolia templi, one at light at Derby (G. B.).

Cleoris viminalis, Henhurst (E. B., J. T. H, and G. B.).

Miselia oxyacanthæ, common throughout the district. Variety *capucina*, occurs occasionally throughout the district.

Agriopis aprilina, Burton (E. B.), Repton (W. G. and G. B.), Barrow (G. A. S.), Derby (G. B.), Henhurst (J. T. H.), Bardon Hill, common (C. F. T.), Rugeley (R. F.), Okeover, near Ashborne (H. F. G.), one in Bretby Park (T. G.).

Euplexia lucipara and *Phlogophora meticulosa*, common throughout the district.

Aplecta prasina, occurs occasionally throughout the district. *A. occulta*, once at Drakelow (G. B.), three at sugar at Bretby, 1881 (T. G.). *A. nebulosa*, common throughout the district.

Hadena adusta, Henhurst (E. B.), Willington (W. G.), Burton (G. B. and J. E. N.), larvæ at Cloud lime quarry (C. F. T.). *H. protea*, fairly common throughout the district. *H. glauca*, Cannock Chase (E. B. and C. F. T.). *H. dentina*, common throughout the district. *H. trifolii* (*chenopodii*), Stapenhill (J. T. H.), common (G. B.). *H. dissimilis* (*suasa*), Henhurst and Repton Shrubs (E. B. and W. G.), larvæ at Burton (C. F. T.), once at Derby (G. B.), Barrow (G. A. S.). *H. oleracea*, common throughout the district. *H. pisi*, Bretby (T. G.), larvæ at Repton Rocks (T. G.), Ashby (G. A. S.), Little Eaton, common (G. B.). *H. thalassina*, common throughout the district. *H. contigua*, common in larva state on Cannock Chase (G. B.).

Xylocampa areola (*lithoriza*), on sallow blossoms (W. G.)

Calocampa vetusta, Henhurst (E. B.), Burton (C. F. T.), once at Bretby (T. G.). *C. exoleta*, Henhurst (E. B. and J. T. H.), Willington (W. G.), Barrow (G. A. S.), once at Bretby (T. G.).

Asteroscopus sphinx (*cassinea*), on lamps on Burton Bridge (E. B.).

Cucullia verbasci, Ticknall lime quarries (C. F. T.), larvæ at Derby (G. B.), Newton Solney (J. T. H.). *C. chamomillæ* (?), larva at Willington (W. G.). *C. umbratica*, common (E. B. and W. G.), Burton (C. F. T.), Drakelow Park palings (J. T. H.), Bretby (T. G.), one at Barrow (G. A. S.), Derby (G. B.), Rugeley, common (R. F.).

Gonoptera libatrix, common throughout the district.

Habrostola tripartita (*urticæ*), Burton (E. B. and W. G.), Barrow G. A. S.), Derby (G. B.). *H. triplasia*, common throughout the district.

Plusia chrysitis, common throughout the district. *P. festucæ*, near Derby (W. G.), one at Barrow (G. A. S.), common near Trent Valley Station (R. F.). *P. iota*, common throughout the district. *P. pulchrina*, very common (E. B. and W. G.), Burton (C. F. T. and G. B.), Shobnall marl pit (J. E. N.), near Ashby (G. A. S.), Osmaston, near Derby (H. F. G.). *P. gamma*, common throughout the district. *P. interrogationis*, Cannock Chase (E. B.).

Anarta myrtilli, Cannock Chase (E. B. and J. T. H.), Breadsall Moors (G. B.)

Heliaca tenebrata (*arbuti*), common (E. B. and W. G.), Barrow (G. A. S.), Breadsall Moors (G. B.).

Heliothis dipsacea and *Chariclea umbra* (*marginata*), once at Breadsall Moors (G. B.).

Phytometra viridaria (*ænea*), Cannock Chase (E. B.), Bladon Hill (J. T. H.), Derby (G. B.).

Euclidia mi, The Lawns (E. B.), Dovedale (J. T. H.). Chartley (T. G.).

Catocala fraxini, occurred once in Burton (E. B.).

Zanclognatha grisealis, Henhurst (E. B. and W. G.), Repton Shrubs (G. F. T.), Bretby (T. G.). *Z. tarsipennalis*, Repton Shrubs (E. B. and J. E. N.).

Pechypogon barbalis, Grange Wood (E. B. and J. T. H.), near Ashby (C. F. T.).

Hypena proboscidalis, common throughout the district.

Brephos parthenias, seen flying round birches in Repton Shrubs, 1882

(To be continued.)

SILK IN ASSAM.*

ASSAM AS A SOURCE OF SUPPLY TO THE ENGLISH MARKET.

Commercial worthlessness of the Wild Silkworms of Assam.—Some misapprehension seems to prevail among English silk-spinners with regard to the nature of the silkworms which furnish the silks of Assam. I find the domesticated *muga* and *eri* included in Mr. Wardle's pamphlet on the wild silks of India; while in a lecture on silk-spinning, delivered in the Technical College, Glasgow, the tusser worm is alluded to as generally cultivated in this province. A similar misconception (so far as Assam is concerned) appears to pervade the Resolutions of the Goverment of India of the 23rd November, 1875, and of the 28th February, 1879, directing attention to undomesticated silk-spinning worms in general and to the tusser silkworm in particular, and asking for certain information regarding them. The information required will be found in the second part of this note; but in treating of the silks of Assam it is desirable to make clear at the outset that from the wild silkworms of Assam, as they now exist, nothing whatever is to be expected. They may possess a scientific interest, but they are certainly destitute of all commercial value, present or perspective. Their cocoons in the wild state are not to be found in numbers anything like sufficient to repay the cost of collecting, or to furnish the slightest hope that they will ever be able to supply the English market. It is exceedingly doubtful whether by the most strenuous efforts one hundredweight of wild cocoons of all sorts could be collected in the whole of the Assam Valley. The commonest of all is the variety of tusser, called ***kutkuri*** in Assam, and this is so rare that virtually one never hears of it. In times previous to the British rule this worm used to be cultivated to a small extent in the vicinity of Jorhât, but it has long fallen out of fashion; and in 1877 the Chief Commissioner of Assam was of opinion that to attempt to create a tusser silk industry in this province would be simply to court failure. More recently the failure of Major Coussmaker's operations in the Deccan has proved the futility of attempting to make anything out of tusser in Assam, where it is vastly less abundant. Such being the prospects of tusser, it is hardly necessary to speak of the other wild worms of Assam. Eight species are described, whereof three are the wild varieties of the *pát*, *muga*, and *eri* worms, and none of them are turned to any practical account, though cocoons found by chance in the jungle may occasionally be brought home by the cultivator, and reeled or spun together with cocoons of his own brood. In the wild state they occur but sparingly, their principal habitat being the dense and unpeopled jungle of the submontane tracts, while the possibility of domesticating them in Assam need not be considered for a moment. It is not to be expected that the Assamese, who take so little care and trouble with the domesticated worms they have already, could ever be induced to make experiments with a new species, nor is there any reason to believe that the produce of the wild worms, even if successfully cultivated, would prove in any way superior to the existing silks of the country.

---

* Extract from report of Mr. E. Stack, Director of Agriculture in Assam.

The Domesticated Silkworms of Assam.—Dismissing the wild worms, therefore, from consideration altogether, we have three kinds of domesticated worms in Assam, or rather, it may be said, in the Brahmaputra Valley, for the Surmá Valley is not generally a country of silk cultivation. These are the *pát* or mulberry worm (*Bombyx textor*); the *muga* or *sum*-feeding worm *Antheræa assama*), whose cocoon, like that of the *pát*, can be reeled; and the castor-oil worm (*Attacus ricini*), yielding a silk which is never reeled, but spun by hand. Looking simply to their commercial potentialities, these three species of silkworm may at once be reduced to two, by striking out the mulberry worm (*pát*), on account alike of the costliness of its silk, the scantiness of the present supply, and the difficulty of extending its cultivation. The two remaining species, the *muga* and *eri*, present a much more hopeful field of enterprise. They are produced in considerable quantity already; they are thoroughly adapted to the climatic conditions of Assam (being, indeed, probably indigenous to this part of India), and there is no obvious reason why their cultivation should not be capable of immense development. The *eri* is the more promising of the two, both because it is cheaper and more abundant, and also because, being reared entirely indoors, its cultivation does not entail that troublesome necessity of watching by night and day which is imposed upon the *muga* breeder during the period that his worms are on the trees. The *muga*, indeed, yields the finer silk, but as it is only in the roughest shape that Assam silk can hope to become an article of demand in the English market, the difference in quality will, perhaps, prove to be a matter of secondary importance.

Form of Silk Trade possible between Assam and England.—There are two forms in which a silk trade is conceivable between Assam and England. We may export the thread, or we may export the cocoons. It may be said at once that the export of thread would never pay. *Muga* thread is now selling at about Rs. 8 and *eri* at about Rs. 5 the seer (6s. 8d. and 4s. 2d. the lb.); and, when it is remembered that the reeling is of the rudest character possible, that the thread is coarse and uneven, and that no two skeins as a rule will be found to correspond in quality, it will easily be understood why *muga* is incapable of competing with the finer and not more expensive silks of Bengal; and, indeed, in Bengal itself the silk reeling business has for some time been in a stationary or decaying condition. *Eri* thread is still more "uneven, gouty, and knibby," and would probably be regarded by the English manufacturer as unfit for employment for any purpose. From the export of cocoons, on the other hand, there may possibly be something to hope. The manufacture of silk plushes and similar fabrics out of waste cocoons imported from India or China is a flourishing branch of the silk industry in England, and although China has hitherto been the principal source of supply there is no reason why Assam should not contribute large quantities of an article which is produced with so much ease in the valley of the Brahmaputra.

Now, in comparison with other parts of India, Assam seems to possess superior capabilities for supplying a demand of this nature. The conditions of tusser cultivation in Bengal, as described by the Commissioner of Chota Nagpur (Supplement to 'Calcutta Gazette' of 31st Oct., 1883) appear much less favourable than the conditions of *muga* cultivation in this Province. He calculates that a man can tend fifteen trees, yielding 450 cocoons in an ordinary year and 1500 in a bumper year such as occurs occasionally; and the selling price of the cocoons is 160 the rupee. The *muga* cultivator in Assam would obtain more than 3000 cocoons from an equal number of full-grown *sum-*

trees, and the price of the whole cocoons is about 600 the rupee. It follows that Assam ought to be in a much better position to supply cocoons to the English silk-spinner than the principal tusser producing districts of Bengal. If a similar calculation be made with regard to *eri* cocoons, the result appears still more favourable.

Previous attempts to develop Silk Cultivation.—No attempt seems ever to have been made to develop the cultivation of *muga* for the English market, but we have the record of Mr. C. H. Lepper's experiment with *eri* in the Lakhimpur district about 1872-73. Mr. Lepper was commissioned by Messrs. Lister & Co. to take up land and try the experiment of rearing the *eri* worm on a large scale, so as to thoroughly prove the practicability of procuring silk in sufficient quantity to make the business pay. His choice of a site in the southern portion of Lakhimpur was perhaps an unfortunate one, as the worm is much more widely cultivated on the confines of Kámrúp and Darrang. He found the climatic conditions exceptionally favourable, the supply of food abundant, and the worm so peculiarly adapted to breeding as to suggest the belief that with proper care a constant rotation of crops could be obtained, so that the operations of breeding and spinning might go on uninterruptedly all the year round. Some experiments made with the cocoons also pointed to the possibility of considerably improving them in size and quality. But the difficulty of procuring labour, and its costliness when procured (local labour being quite inefficient) were so great as to deter him from advising Messrs. Lister and Co. to continue operations. His own estimate was that the cost of suitable buildings on even a moderate scale, to replace the native style of house, which is not proof against damp, rats, or insects, would not be less than £3000. A similar attempt was made some six years ago by a European in the neighbourhood of Rangia, in Kámrúp, but he was compelled to abandon it after losing his entire crop by disease.

Experiments now being made.—In the face of these precedents, the prospects of *eri* cultivation on a large scale, either by the Government or by private enterprise, is not encouraging, and the difficulties are still greater in respect of *muga*. But the case is different with the native breeder, who spends nothing and therefore can suffer no loss. Were a market once opened for *muga* and *eri* cocoons at fixed rates and in unlimited quantity, it is probable enough that the cultivators would be glad enough to bring their cocoons to it, and that, under the stimulus of a certain and regular demand, the supply would soon begin to increase. Only the waste cocoons—the perforated cocoons through which the moth has been allowed to eat its way—would be required, and the seller would not even be put to the trouble of boiling his cocoons as he does now before offering them for sale. The practicability of getting up a supply for the English silk-spinner in this way depends, of course, upon the price which he finds it worth his while to offer for the article supplied. In November, 1883, I despatched a small consignment of *eri* cocoons to a silk-spinner in England, who has sent me samples of the yarn prepared from them, and asked for a large supply. It is not safe to enter into any minute calculations in these matters, but it seems to me that a price of 1s. per pound for either *eri* or *muga* cocoons in London would repay the exporter. The great want at present is free communication between the exporter and the producer. The indolence and suspiciousness of the Assamese ryot have to be overcome, and this can be done far better by private enterprise than by Government agency, though the latter may be able to help private enterprise in pushing its way in Assam. As it is, the demand for waste silk in England has already begun to attract a trade in *eri* cocoons, and some 400 to 500 cwt. are exported annually from Goálpára to Calcutta for shipment to London, but this supply is very far from adequately representing the productive capabilities of the Assam Valley.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Pieris daplidice.—My brother, writing from Folkestone, reports that a schoolboy has recently taken in the Warren there two specimens of this insect. He has seen one of them; it is in good condition, apparently fresh from the chrysalis.—Bernard Cooper; 2, Pembury Road, Tottenham.

Melitæa cinxia. — The fastidious taste in the choice of localities of *M. cinxia* is well known. It has made this and the adjacent isles favoured spots in the eyes of entomologists by its distinguished presence. But though many hundreds have passed under my eye and through my net, I never saw a specimen sufficiently differing from the type-form worthy of the name of a variety until now. To-day—half a mile inland, an unusual occurrence—I captured a specimen in good condition, but for a nick in one under wing, in which the black markings of the upper wings have coalesced so as to form a broad band. This band is a quarter of an inch wide on the costal margin, growing gradually smaller, but equally clear as it approaches the inner margin. In the centre of the band, but towards the costa, the band opens and shows a spot of the usual ground colour. Am I right in supposing that such varieties are (as according to my experience) uncommon in this species?—(Rev.) Frank E. Lowe; St. Stephen's, Guernsey, July [illegible].

Chærocampa nerii at Hartlepool.—A specimen of *Chærocampa nerii* was taken by myself yesterday morning on the railings surrounding a timber yard. It is in fairly good condition, though evidently a hybernated specimen, the colours being somewhat faded. I believe this will be the first record of its occurrence so far north. Mr. J. G. Robson saw it alive.—J. Gardner; 6, Friar Terrace, Hartlepool, July 24, 1885.

Acronycta alni at Sugar.—I was pleased to take a specimen of the above insect, on an oak tree, at sugar, near Lyndhurst, on [illegible] of June.—Percy Bendall; London, 1885.

Grapholitha cæcana at Deal.—While collecting during the present month on the south-east coast of Kent, in the neighbourhood of Deal, in company with two friends, we were fortunate in securing a nice series each of *Grapholitha cæcana*. I also captured a lovely series each of *Argyrolepia mussehliana*, *Scoparia pallida*, *Acidalia ochrata*, *Pterophorus lienigianus*, and *Chauliodus illigerella*. Insects generally were abundant. *Lithosia lutarella v. pygmæola* was already well out, and *Conchylis alternana* just appearing. Many species on the cliffs were, however, much worn, owing I suppose to the windy weather prevalent during the early part of this month, and the latter part of last.—J. W. Tutt; Rayleigh Villa, Westcombe Park, Blackheath, S.E., July, 1885.

Discovery of the Larva of Grapholitha cæcana, *Schl.*—J [illegible] 4, from observing the habits of this insect, I felt sure that *Onobrychis sativa* was its food-plant. In August, upon cutting open some of the previous year's stems, I obtained undoubted traces of its work, some of the stems being filled with decaying frass. Successive visits to the locality were paid in September, October, and November, and not till then was I rewarded by the discovery of the larva in the stems near the roots of *Onobrychis sativa.* Seven larvæ were found, which had then apparently ceased to feed, and from them the following description is drawn up:—Length 5 lines, somewhat tapering, the 2nd and 3rd segments being broader than any of the others, the 3rd being the broadest. Colour bright yellow; head pale yellowish brown; face with two dark brown lines, which, with the dark brown mouth for base, form a triangle. 1st segment with two indistinctly defined pale yellowish brown plates, anal segment pale brown, dorsal vessel indistinctly pale brown. Spiracles small, pale brown; legs yellow, prolegs very short, yellow on the 6th, 7th, 8th and 9th segments. On the head and following segment are a few transparent hairs. The larva is active in its movements, progressing very readily backwards. It should be remembered that these larvæ may have been full-fed for some time before November, and perhaps have undergone a change in colour. On April 3rd, 1885, a dark brown patch had developed on the anal segment, the larva after its hybernation being somewhat thinner. On June 12th it had changed to a bright yellow pupa within the cocoon which I cut open. On June 25th, first the wing-cases and then the whole pupa changed to a rich dark brown. The imago (female) emerged on July 1st. The egg is probably laid singly and upon the stems of the plant about the middle of July. The larva commences to feed about three parts up the stem and works downward to the root, filling the stem above with pale brown frass. Its presence may be ascertained with certainty by slicing open the stems about halfway up, when the frass will betray it to the collector. Two of the larvæ which I cut out closed one end of the stem completely with silk, making at the other a gallery with a small hole for exit. The position of this species in our lists is unsatisfactory, and I am repeatedly asked to say something thereon. Mr. South puts it at the end of *Grapholitha,* which seems about as bad a place as one could find for it. To enter at any length upon a discussion of this point would involve the whole question of the classification of the Tortricidæ, and this is ground upon which I almost fear to tread. They are certainly in a most unsatisfactory condition, but any partial revision based upon British species alone seems hardly worth doing, and surely the North American species would have to be considered, and if so, where shall we draw the line? And for a sound classification of the Tortricidæ of the world we must await more ample materials. I can but say that the species seems to be somewhat closely related to the genus *Bactra*, Es.; the habits of the larva also support this view. It is also a close ally of *Catoptria hypericana.*—G. Coverdale; 24, Fleming Road, Lorrimore Square.

Dryinus formicarius, *Latr.*, at Shiere.—On June 15th, while beating a maple bush to obtain the little Homopteron, *Rhinocola aceris*, I took a fine example of this curious insect, remarkable not only for its singular structure, but also for its great rarity, for I believe there is only a single record of its capture before in England, and it appears to be equally uncommon in other countries. It is strange that as yet the male is quite unknown, and in fact the economy of the creature is also entirely a guess, as nothing has ever been discovered of its habits, or upon what insect it is parasitic, as no doubt it has a host of some kind. In the 19th vol. of the Ent. Mo. Mag. Mr. Douglas has given some notes concerning the parasitism of its near ally, *Gonatopus*, on certain species of Homoptera; and I think it extremely probable that we may look in that Order for its prey. It must, however, be a large insect to nourish another of such size, my specimen being quite 3 lines in length. The only large Homopteron that I could find in the same bush was *Cixius contaminatus*, and this was in abundance; and I think it not at all unlikely that it was the insect from which the *Dryinus* receives its supply of food.—E. Capron; Shiere, July 1, 1885.

A Pest of Flies.—Since Monday Oxford has been visited by a plague of flies, which renders walking in the streets extremely uncomfortable. As far as I can observe, the swarm is chiefly composed of two varieties of the winged aphis, one being bright green in body, and the other a lighter yellowish green with black-brown mottled patches. There are also innumerable beetles, apparently a tiny species of rove beetle, which have a habit of getting into the nostrils of the passers-by, and, if *crushed*, emitting an insufferable odour.—G. E. Sims, jun.; Oxford.

REVIEW.

Report of Observations of Injurious Insects and Common Farm Pests during the year 1884, *with Methods of Prevention and Remedy.* Eighth Report. By ELEANOR A. ORMEROD, F.R.Met.Soc., Hon. Consulting Entomologist to the Royal Agricultural Society, &c. Simpkin, Marshall & Co. Royal 8vo, 122 pp.

WE are glad to receive another of these valuable Reports, showing the good work that is being organised by Miss Ormerod throughout the country. In the Preface it is stated that "The attention bestowed on the very important subject of insect prevention is showing year by year that the national losses are not by thousands, but by millions, of pounds. The loss in the hop failure of 1882 was estimated at a million and three-quarters, that from turnip-fly of 1881 at over half a million pounds sterling."

The subjects especially dealt with this year are Birds and the depredations of sparrows, Hop-aphis, and Warble-fly. In writing of the birds the reporter is very careful to state that "nobody wishes to destroy the small birds broadcast. We should suffer severely if their presence *generally* was lessened. . . . . But with regard to the one item of sparrows, its special habits make this bird an exception to what we may fairly call our regular feathered *friends*." This is demonstrated by evidence from many careful and competent observers; amongst others Mr. A. Molineux, member of the Committee of Agriculture of the Royal Agricultural Society of South Australia, writes:—

> "The sparrows here have driven off nearly all our insectivorous birds, which of course are small, and have generally soft bills and a timid nature; but the sparrow will eat nothing but seeds, while seeds are available. When there are no seeds they will eat fruit,—when there are no seeds or fruit they will condescend to kitchen vegetables (or zonal pelargoniums); but if none of the foregoing are to be had, and the dog, the pig, and the cows cannot be robbed, the sparrow will stay his hunger with Aphides or soft grubs and caterpillars."

The plague of *Charæas graminis* larvæ in South Wales is described and illustrated by a map of the district, some ten miles in diameter, where the ravage was great.

Much careful observation and experiment has been devoted to the hop aphis, and Miss Ormerod thinks there is good reason for believing the course of attack to be as follows:—

"1st. That the first attack of Aphis to the hop begins in spring from wingless females (depositing living young), which come up from the hop-hills. 2nd. That the great attack, which usually occurs in the form of 'fly' about the end of May, comes on the wing from damson and sloe, as well as from hop, and that the hop aphis and the damson hop aphis are very slight varieties of one species, and so similar in habits as regards injury to hop that for all practical purposes they may be considered one. By hop and damson hop aphis I mean the *Aphis* (*Phorodon*) *humuli*, Schrank, and the *Aphis* (*Phorodon*) *humuli*, var. *Malaheb*, Fonsc.; but in no case the *Aphis Pruni*, Réaum., or any other kind.

"Further, it has been shown by the result of various experiments on the hop-ground at Stoke Edith Park, Hereford (allowed us by the kind courtesy of the Lady Emily Foley) that the use of various applications round the hills in the late autumn, or about the beginning of April in spring, completely prevents attack to the bines of those hills until the summer attack came on the wing."

Miss Ormerod differentiates between the two species and gives figures, which we are kindly permitted to reproduce.

"Now, looking at the history of the hop aphis and of the damson hop aphis side by side, we find them starting at the same time in spring respectively on their several plants, continuing similarly to increase; and similarly, about the end of May, to gain the winged state; and up to this date, by constant microscopic examination, I did not find any difference in the frontal development of the young lice of the kinds under consideration when first produced, nor in that of the winged females. The accompanying figures, [Fig. I.] drawn from life, show the similarity."

* * * * * *

"From the latter part of March onward to about the time of the appearance of the fly, I found that the hop-lice had the frontal tubercles and enlarged root-joint, as in fig. I., this sketch being a representation of large numbers sent me from infested hop-plants, and I could detect no difference in form between the lice from hop-plants and those from sloe or damson. At the time of flight from the sloes I figured the wingless females and pupæ (or larvæ containing young) from hop-plants, and also from damson or sloe, and noticed a slightly greater amount of gibbousness in the root-joint of the antennæ of the hop aphis, but, as shown in Fig. II., this difference is very slight. But, continuing the observations after a time, I found a difference in amount of development of these frontals in some of these young hop-lice, and, on being furnished with a supply in hop-cones, on the 26th August, I found that the frontal tubercles and amount of gibbous form of the root-joint of the horns was more developed; in fact, now (that is, in the summer form) they precisely resembled the typical figure of the head of the *humuli* larva given by Mr. Buckton (Fig. III., 1), which I copy for comparison with my own drawing (Fig. III., 2, from a summer specimen)."

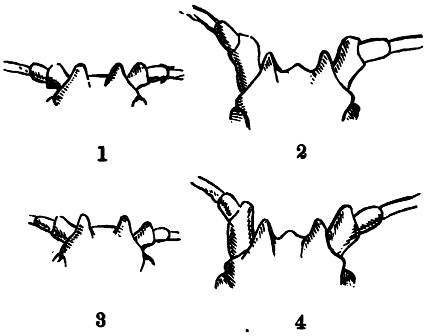


Fig. I.—LARVÆ. WINGED FEMALES.
1, 2, Hop Aphis; 3, 4, Damson Hop Aphis.

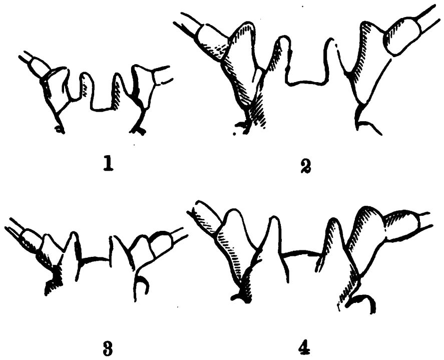


Fig. II.—ADVANCED STAGE (? PUPÆ). WINGLESS FEMALES.
1, 2, Hop Aphis; 3, 4, Damson Hop Aphis.

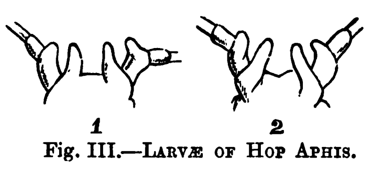
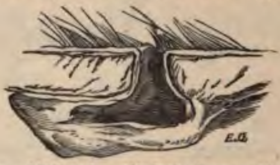


Fig. III.—LARVÆ OF HOP APHIS.

Evidence is then adduced from entomologists of repute in favour of the theory of the hop aphis migrating from the sloe. The opinion held by a large number of hop-growers that the fly comes to some extent on the wing from sloe or damson is considered a strong confirmation of this theory.

Miss Ormerod's great work of the year, however, has been the discovery of mercurial ointment as a simple and inexpensive means of destruction of the warble-fly in cattle.

"The great injury which is caused year after year by this attack is not only from the perforations of the maggots lessening the value of the hides, but from the loss in flesh and milk and health in summer, when the animals are started by their terror of the fly to gallop as fast as they can go; and later on the suffering and drag on the system of supporting may be six, ten, or twenty, sometimes even more than a hundred, of these strong maggots growing up to an inch in length and feeding in the sore, which they keep up from January or February until they are full-grown."



Section of Warble, slightly larger than life.

It is estimated that the annual losses from warble-fly (above is a figure showing section of a warble in the hide) amount to the enormous sum of from *seven to eight million pounds sterling*, and Miss Ormerod shows how the attack may be very greatly lessened, safely, cheaply, and without injury to the hide.

"It should be observed relatively to destroying the maggot that it breathes, or rather draws in the air necessary for it, through the two somewhat kidney-shaped black spots, which are easily seen in the tip of the tail-end of the maggot in an advanced warble. If these 'spiracles' or breathing-pores are choked the insect dies; consequently, if anything like tar or mercurial ointment, or other choking substance, is applied, the maggot is sure to be destroyed. Piercing the warble is not so perfectly certain to kill it, as the operation is not always thoroughly performed. Of the various applications noticed that of mercurial ointment appears the simplest and surest."

The smallest quantity of mercurial ointment (as much as a small pea) placed on the hole in the skin carries death within twenty-four hours.

We strongly recommend our readers to procure this Report, for it is of equal interest to entomologists and to farmers, while cord of patient and unwearying work it cannot fail to win iration of all.

THE ENTOMOLOGIST.

VOL. XVIII.] SEPTEMBER, 1885. [No. 268.

COLEOPHORA TINCTORIELLA, MIHI.

BY GEORGE COVERDALE, F.E.S.

Exp. 8½ lines. Head white, pale grayish ochreous in the centre; face pure white; palpi above, within and beneath white, without pale gray; 3rd joint pointed, more than half as long as the 2nd, from which it rises upwards at a considerable angle. 2nd joint with a white projecting tuft beneath. Antennæ white, annulated with fuscous, sometimes wholly white towards the extremity; basal joint whitish, with a short pale gray tuft beneath. Thorax white, more or less pale ochreous down the centre; patagiæ white, pale ochreous towards the tips. Abdomen gray, dusted with whitish scales above and beneath. Legs white. Anterior wings rather broad, dark brownish ochreous in the costal region, ochreous towards the inner margin, but varying considerably in intensity of colouring, some specimens being nearly as dark as *Coleophora saturatella*, others almost entirely ochreous. A pure white streak runs along the costa, slightly broader beyond the middle, reaching nearly to the apex, where it becomes attenuated and loses its purity of colour. Along the fold is a narrow pure white line, not reaching the margin. *The base of the wing between the fold and the inner margin is white, more or less mixed with ochreous*, the former colour being continued as a narrow line along the inner margin to the anal angle. Nearly in the middle of the disk above the fold is a short, slender, pure white line, sometimes interrupted. Apical fringes brownish ochreous, grayish fuscous towards the inner margin. Hind wings gray, with long grayish fuscous fringes.

The following is a description of the larva, which feeds in a pale yellowish brown case upon the leaves of *Genista tinctoria* in May and June:—Length, 3 lines. First three or four segments pale greenish, the remaining (those which are not extruded from the case, and consequently unexposed to the light) of a dirty yellow colour. Head dark brown; 2nd segment with a large black transverse oval plate, divided down the centre by a thin longitudinal pale greenish line; 3rd segment with a similar but much smaller plate; anal segment with a black plate; 2nd, 3rd, and 4th segments with small black spiracles. The dark pulsating dorsal vessel is conspicuous. The segments enclosed within the case are stouter than the first four segments. The larva lives in a pale brown case formed of about six leaflets of *Genista tinctoria*, and is constructed much in the same way as that of *Coleophora saturatella*; but is generally larger, looser, more straggling, and less compact in appearance. It is to be found in May and June making somewhat inconspicuous blotches in the leaves of *Genista tinctoria*, the imagines appearing towards the end of June and later. The earliest emergence I obtained was on the 24th of that month.

The only British species with which this could be confounded is *C. saturatella*, Stn., to which it is very closely allied. But *tinctoriella* may always be distinguished by its bright and more ochreous appearance, and by the presence in greater or less quantity of pale ochreous scales at the base of the wing on the inner margin and on various parts of the thorax above. A microscopic examination of many specimens shows *saturatella* to be destitute of this pale ochreous pigment on any part of the body or wings, which thus becomes a good distinguishing character between the two species. I am unable to find any marked difference between the larvæ of these two insects, which were bred side by side under similar conditions. The dark brown case of *saturatella* from broom is easily distinguished from the almost ochreous one of *tinctoriella*, the difference being of course due to the different colours assumed by the leaves of their respective food-plants in withering, the broom turning almost black. *C. saturatella* appears to be a somewhat later insect than *C. tinctoriella*, for the broom was quite leafless this spring at a time when *tinctoriella* was almost full-fed. *C. tinctoriella* also was the first to emerge. Mr. A. C. Vine, of Brighton (to whom we are indebted for this addition to the genus), tells me that in the locality in which he finds *tinctoriella* he has searched well, but unsuccessfully, for *saturatella*, although the broom grows there in abundance. He also tried to feed his *tinctoriella* upon broom, but they would not touch it.

When last year Mr. Vine sent me *tinctoriella* to name as doubtfully *saturatella*, I replied that I believed it to be identical with the continental *bilineatella*, Zell., which also feeds upon *Genista tinctoria*, but upon looking further into the subject this conjecture became more and more improbable. Now *bilineatella*, Zell., seems shrouded in mystery. Zeller says ('Linnæa Entomologica,' Bd. iv., 272)—"The discoidal line is entirely absent." *C. tinctoriella* shows this line clearly, which, had Zeller's description of *bilineatella* been accurate, would have sufficed to separate the two species. But specimens of *bilineatella*, Zell., in the British Museum and others I have seen in Mr. Stainton's collection show this line, the existence of which Zeller denies. Herrich-Schäffer ('Systematisches Bearbeitung,' v., No. 686, p. 239, fig. 690) figures *bilineatella* with a discoidal line. Furthermore, upon Zeller's (Lord Walsingham's) own specimens this discoidal line is to be traced, which is therefore of no use as a distinguishing character for *bilineatella*, Zell. Again, under this name two very different insects are met with. In Mr. Stainton's collection, bred from continental larvæ in England, is a series of *bilineatella*, some of the specimens being very dark brown, like *saturatella*, and others bright ochreous, like the ordinary continental type of the species. The cases from which the insects were bred are also of two kinds, the one dark brown, as in *saturatella*, the other pale brown, as in *tinctoriella*. Heinemann says (and it is generally known) that this so-called *bilineatella*, Zell., feeds upon broom as well as *Genista tinctoria*, and it at once occurred to me that in all probability there were two distinct species, one from broom, the other from *Genista tinctoria*, united under the name of *bilineatella;* and it seemed highly probable that the ochreous insects came from the pale *Genista* cases, whilst the dark broom cases produced the darker insect. Accordingly I wrote to my friend, Herr August Hoffmann, of Hanover, for assistance, which he most readily afforded. In his own collection were two brown specimens bred from *Sarothamnus scoparius*, with dark brown cases. He next examined the cabinet of Herr Glitz, in which were eight specimens; four of them bred by himself (Glitz) from broom were dark brown, with dark cases; the other four (two of them with Zeller's own labels) were pale ochreous, being bred from ochreous *Genista tinctoria* cases. Heinemann's collection was next inspected, with the following result:—Three insects with dark brown cases from broom, under the name *spartiella*, Hein., with Heinemann's own labels, "*Spartium scoparium* = *Sarothamnus scoparius*"; seven ochreous specimens, under the name *bilineatella*, Zell., with a pale case from *Genista tinctoria*. It seems pretty clear, then, that Heinemann intended to separate the two forms as distinct species, that from *Genista tinctoria* as *bilineatella*, Zell., the other from broom as *spartiella*, Hein.; but Wocke, who finished Heinemann's work, has united them under the name *bilineatella*, Zell. Dr. Rössler, in 'Die Schuppenflügler,' &c., says that the clear yellow cases found on *Genista* are larger than the dark ones from *Sarothamnus*.

It was my intention, before saying anything on this subject, to rear all the four forms together for comparison, but all my efforts to obtain living larvæ from the Continent have been unavailing; and as it is very improbable that an opportunity will again present itself, it seems best to publish the evidence already collected. Enough has been said, I think, to show the distinctness of *tinctoriella* from *saturatella;* neither can it be confounded with the form *spartiella*, nor with *bilineatella*. It seems, therefore, that we have four species in this group, *viz.:*—

C. bilineatella, Zell.—Imago ochreous. Case ochreous. *Genista tinctoria.*

C. tinctoriella, Cov.—Imago brown. Case ochreous. *Genista tinctoria.*

C. saturatella, Stn.—Imago brown. Case dark brown. *Sarothamnus scoparius.*

C. spartiella, Hein.—Imago brown. Case dark brown. *Sarothamnus scoparius.*

The two species which feed on *Genista tinctoria* are most readily separated from each other; but between *spartiella*, Hein., and *saturatella*, Stn., there seems to be little distinction, and further investigation may induce us to sink *spartiella*, Hein., as synonymous with *saturatella*, Stn. *C. tinctoriella* holds an intermediate position between *bilineatella*, Zell., and the (two?) broom-feeding species. It may perhaps be regarded as the B[illegible]epresentative of *bilineatella*, its more sombre colouring being in consonance with the general action of our climate in toning down bright colours. To Mr. Vine belongs the honour of this discovery, and in conclusion I can but acknowledge his kindness in furnishing me last year with specimens and this year with larvæ. My best thanks are due also to Mr. Machin for his assistance with *saturatella;* also to Mr. Stainton, Herr Aug. Hoffmann, and others.

24, Fleming Road, Lorrimore Square, S.E., August 8, 1885.

LEPIDOPTERA IN ARGYLLSHIRE.

By Howard Vaughan, F.E.S.

In last June I spent a few weeks near Kilmartin, Western Argyllshire. I was unable to devote as much time as I could have wished to exploring the Lepidoptera of the district, and my operations were to some extent impeded by unfavourable weather. The season was also a late one, and many species known to occur were not to be found.

Having been furnished by Mr. C. A. Briggs with a locality in the hills of North Knapdale for *Melitea aurina* (*artemis*), I went there several times. Though unsuccessful on my first journey, on subsequent occasions I met with the species, but always sparingly. The specimens obtained were very brightly coloured; some resembled the variety *hibernica* taken by Mrs. Battersby, and there were also some nice aberrations, or, as we used to call them, varieties.

In this same elevated locality *Pieris napi*, *Cœnonympha pamphilus*, and *Thecla rubi* were not uncommon, and one *Lycæna icarus*, a very ordinary one, made its appearance. *Lasiocampa rubi*, very dark and well-marked, differing much from southern specimens, was common, but difficult to capture. *L. quercus* larvæ, which will doubtless develop the variety *callunæ* of Palmer, occurred. *Spilosoma fuliginosa*, the usual dark Scotch form, completes the list of Bombyces.

Anarta myrtilli, *Euclidia mi*, and *Phytometra viridaria* (*ænea*), all fairly common, represented the Noctuæ. The Geometræ were *Eupithecia satyrata*, common, but difficult to obtain in fine condition. The specimens were less spotted than some I have from *Edinburgh*, *which I* believe Mr. Stainton has named *callunaria.* *Fidonia atomaria* was abundant and somewhat variable. *Acidalia fumata* was only beginning to put in an appearance.

The Pyrales were *Pyrausta purpuralis* and *Botys fuscalis*, and the only *Crambus* was *C. pratellus*,—all common. Tortrices were by no means plentiful, and I only observed *Penthina dimidiana*, *Bactra lanceolana*, *Ephippiphora pflugiana*, *Phoxopteryx uncana*, *Cnephasia musculana*, *Phlæodes tetraquetana* (brightly marked), *Eupœcilia ciliella* (large), and *Argyrolepia hartmanniana* (*baumanniana*). Near my headquarters *Pieris brassicæ*, *P. napi*, *Argynnis selene*, *Cœnonympha pamphilus*, and *Lycæna icarus* were the only butterflies to be found. I captured also the following:—*Nudaria mundana* larvæ, commonly on lichen-covered walls (the imagos have since appeared, and are somewhat darker than their southern relatives); *Euchelia jacobeæ*, common; *Hepialus humuli*, abundant, but exhibiting no variation; *H. velleda*, rare; *Thyatira batis*, one; *Odontoptera bidentata*, rather dark; *Amphidasys betularia*, typical; *Melanippe montanata*, abundant and smaller than the southern English specimens, and one is as dark as the Shetland examples; *M. fluctuata*, also dark; *Hypsipetes trifasciata* (*impluviata*), in an alder swamp; *Eupithecia satyrata*, on a moss; *E. castigata*, the usual type; *E. vulgata*, strongly marked, and reminding me of some sent to me from Renfrewshire by Mr. Dunsmore; *Scoparia ambigualis*, rather darker than usual, was not uncommon in some places.

I should mention that some female *P. napi* captured on a moss are much darker than usual, resembling some from Arran in Mr. Briggs's collection. Although the species was abundant throughout the district, I was unable to find this dark form in any other place. I was especially anxious to have obtained a long series of *L. icarus*, but was evidently too early. The solitary female I secured was very "ordinary," with very little blue. Most of the males, however, were darker in the tint of blue than our southerners, and some have a distinct black margin to the wings.

During my stay I had an opportunity of visiting one of the smallest islands in the Sound of Jura. There I found insects were uncommon, but captured *Scoparia ambigualis*, another *Scoparia*, which may be a dark form of *dubitalis*, *Penthina* *na*, *Phoxopteryx lundana*, and *Blabophanes rusticella*.

The foregoing list does not contain the names of any rarities, but I think it is advisable to place on record anything which may contribute to our knowledge of little-worked localities, and the acquisition of interesting local forms is always desirable.

55, Lincoln's Inn Fields, London, August 17, 1885.

THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

(Continued from p. 212.)

GEOMETRÆ.

Uropteryx sambucaria, common throughout the district.

Epione apiciaria, Henhurst and Burton (E. B.), osier beds at Repton (W. G.), Winshill Lane (G. B.), once at Bretby (T. G.), once at Barrow (G. A. S.), Osmaston Lane, near Derby (H. F. G.), Little Eaton (G. B.). *E. advenaria*, Willington (E. B.).

Rumia luteolata (*cratægata*), common throughout the district.

Venilia maculata, Dovedale (E. B.), Dyden Wood, near Ashborne (H. F. G.), Charnwood Forest (J. T. H.).

Metrocampa margaritaria, Burton, &c. (E. B.), Repton (W. G.), Repton Shrubs (G. B.), Bretby and Tatenhill (T. G.), near Ashby (C. F. T.), common near Cauldwell (J. T. H.), Seal Wood, common (J. E. N.).

Ellopia prosapiaria (*fasciaria*), Breadsall Moors (G. B.).

Eurymene dolabraria, Henhurst, &c. (E. B.), near Repton (W. G.), Repton Shrubs (G. B. and C. F. T.), Derby (G. B.), once at Barrow (G. A. S.), near Ashborne (H. F. G.).

Pericallia syringaria, Rolleston (E. B.), scarce (W. G.), Burton (C. F. T.), Derby (G. B.), Barrow (G. A. S.).

Selenia bilunaria, common throughout the district. *S. lunaria*, Henhurst (E. B.), one at Repton Shrubs (W. G.), Derby (G. B.). *S. tetralunaria* (*illustraria*), once at Osmaston, near Derby (H. F. G.).

Odontopera bidentata and *Crocallis elinguaria*, common throughout the district.

Eugonia alniaria (*tiliaria*), Burton, not rare (E. B. and W. G.), Burton, at light (J. T. H., &c.), Ashborne (H. F. G.), common (G. B.). *E. fuscantaria*, Burton (E. B.), one near Eggington (W. G.), Eggington and Derby (G. B.), Barrow (G. A. S.). *E. erosaria*, Burton, but rare (E. B.), larva at Repton Shrubs (G. B.). *E. quercinaria* (*angularia*), Burton, common (E. B. and W. G.), Forest banks, Needwood (J. T. H.), Repton Shrubs, common (G. B.), Bretby Park (J. E. N. and T. G.), Ashby (G. A. S), Bardon Hill, abundant (C. F. T.).

Himera pennaria, Henhurst (E. B. and W. G.), Repton Shrubs, common (C. F. T.), Barrow (G. A. S.).

Phigalia pedaria (*pilosaria*), common throughout the district.

Nyssia hispidaria, Repton Shrubs (E. B.), larvæ in Repton Shrubs (G. B.), one female in Repton Shrubs (J. E. N.).

Biston hirtaria, Rugeley (R. F.).

Amphidasys strataria (*prodromaria*), Burton and Repton Shrubs (E. B.), one at Findern (W. G.), Repton Shrubs (G. B.), Newton Road (J. T. H.), one in Drakelow Park (G. H. W.), Cannock Chase (C. F. T.). *A. betularia*, common throughout the district. Variety *doubledayaria*, occurs throughout the district.

Hemerophila abruptaria, Burton (E. B., C. F. T., &c.), Willington (W. G.), Osmaston, near Derby (H. F. G.).

Cleora lichenaria, Henhurst (E. B. and W. G.).

Boarmia repandata, Burton, common (E. B.), Repton Shrubs (W. G., G. B., &c.), Seal Wood (J. T. H. and J. E. N.), Decoy plantation, Bretby (T. G.), Barrow (G. A. S.). *B. gemmaria* (*rhomboidaria*), common throughout the district.

Tephrosia crepuscularia, Barrow (G. A. S.), Cannock Chase (C. F. T.). *T. biundularia*, common throughout the district. *T. punctularia*, near Repton (W. G.), Repton Shrubs (G. B.), Little Eaton (G. B.), Cannock Chase (C. F. T.).

Pseudoterpna pruinata (*cytisaria*), once at Willington (W. G.).

Geometra papilionaria, Burton, &c. (E. B.), Burton (G. H. W.), Repton and Willington (W. G.), Repton Shrubs and Derby (G. B.), Caldwell (J. T. H.), once near Barrow (G. A. S.).

Phorodesma pustulata (*bajularia*), once at Shobnall marl pit (J. T. H.).

Iodis lactearia, common throughout the district.

Hemithea strigata, Henhurst (E. B.), formerly near Burton (J. T. H.). near Ashborne (H. F. G.).

Zonosoma punctaria, Repton Shrubs (C. F. T., &c.), near Ashborne (H. F. G.)

Asthena luteata, Derby (G. B.), Repton Shrubs (C. F. T.). *A. candidata*, Henhurst (E. B., J. T. H., and J. E. N.), Repton Shrubs (C. F. T.), Seal Wood (G. B.). *A. sylvata*, Henhurst (E. B.), once near Repton (W. G.), once in Repton Shrubs (G. B.), Cannock Chase (C. F. T.). *A. blomeri*, Shobnall (E. B.), once near Repton (W. G.), wood near Hoar Cross (J. E. N.), Swilcar Wood, Needwood Forest (W. M. A.), common some years in Hoofies Wood, near Hartshorne (T. G.).

Eupisteria obliterata (*heparata*), Repton and Seal Woods (E. B.), Repton Shrubs (W. G., C. F. T., &c.), Repton rocks (T. G.), Barrow (*G. A. S.*).

Acidalia dimidiata (*scutulata*), common (E. B. and W. G.), Bretby (T. G.), Barrow (G. A. S.), Derby (G. B.). *A. bisetata*, common (E. B.), Shobnall (J. T. H. and G. B.), Bretby (T. G.), Barrow (G. A. S.), Breadsall Moors (G. B.). *A. virgularia*, common (E. B.), beaten out of ivy (W. G.), Burton, common (C. F. T.), Barrow (G. A. S.), once at Breadsall Moors (G. B.). *A. subsericeata*, Dovedale (G. B.). *A. remutaria*, Shobnall, &c. (E. B.), Henhurst (W. G.), Repton Shrubs (W. G., G. B., &c.). *A. fumata*, Dovedale (G. B.), Chartley (T. G.). *A. imitaria*, Burton (E. B. and W. G.), Barrow (G. A. S.), once at Derby (G. B.). *A. aversata*, common throughout the district. *A. emarginata*, Burton (E. B. and W. G.), Barrow (G. A. S.).

Timandra amataria, Henhurst, &c. (E. B. and W. G.), Tatenhill (J. E. N. and T. G.), near Ashby (C. F. T.), Barrow (G. A. S.), Osmaston, near Derby (H. F. G.), Rugeley, common (R. F.).

Cabera pusaria and *C. exanthemaria*, common throughout the district.

Bapta temerata, Henhurst (E. B.), scarce (W. G.), Shobnall Road (J. T. H.).

Macaria liturata, Seal Wood (J. E. N.), Breadsall Moors (G. B.).

Halia vauaria (*wavaria*), common throughout the district.

Strenia clathrata (?), Cannock Chase, common (R. F.).

Panagra petraria, Willington (W. G.), Parson's Brake (C. F. T., &c.) Cannock Chase (C. F. T.), Bretby Park (T. G. and J. E. N.), Repton Shrubs (W. G., G. B., &c.), Breadsall Moors (G. B.).

Numeria pulveraria, Henhurst (E. B.), once near Bretby (T. G.), Breadsall Moors (G. B.).

Scodiona belgiaria, Cannock Chase (T. G.).

Ematurga atomaria, Cannock Chase (E. B., C. F. T., &c.), once in Bretby Park (T. G.), Chartley Moss, abundant (J. T. H.), Breadsall Moors (H. F. G.).

Bupalus piniaria, Seal Wood (E. B.), one at Willington (W. G.), Cannock Chase (C. F. T.), Breadsall Moors, common (G. B. and J. E. N.), Variety *flavescens* (*piniaria*), Breadsall Moors (G. B. and J. E. N.).

Aspilates strigillaria, Cannock Chase (E. B.), Chartley (T. G.).

Abraxas grossulariata and *A. sylvata*, common throughout the district.

Ligdia adustata, near Ashby (G. A. S.).

Lomaspilis marginata, *Hybernia rupicapraria*, and *H. leucophearia*, common throughout the district. *H. aurantiaria*, abundant in Repton Shrubs. *H. marginaria* and *H. defoliaria*, common throughout the district.

Anisopteryx æscularia, generally distributed throughout the district.

Cheimatobia brumata, common throughout the district. *C. boreata*, fairly common in Repton Shrubs.

Oporabia dilutata, common throughout the district.

Larentia didymata, common throughout the district. *L. multistrigaria*, Breadsall Moors (G. B.). *L. cæsiata*, Dovedale, common (H. F. G.). *L. viridaria* (*pectinitaria*), generally distributed throughout the district.

Emmelesia affinitata, common throughout the district. *E. alchemillata*, Seal and Grange Woods (E. B.), Burton (C. F. T.), Bretby (J. E. N.), Barrow (G. A. S.). *E. albulata*, Barrow (G. A. S.), Anslow (C. F. T.), Seal Wood (J. T. H.), Repton Rocks (T. G.). *E. decolorata*, common throughout the district. *E. tæniata*, Dovedale (F. M. Spilsbury).

Eupithecia venosata, Shobnall (E. B.), Shobnall marl-pit (J. T. H.), Repton and Little Eaton (G. B.). *E. linariata*, Barrow (G. A. S.), railway banks at Willington (G. B.), Breadsall Moors (G. B.). *E. pulchellata*, Shobnall (E. B.), Repton Shrubs and Derby (G. B.), Barrow (G. A. S.), Cannock Chase (T. G.). *E. oblongata* (*centaureata*), Burton (C. F. T.), Repton Shrubs and Derby (G. B.), near Ashby (G. A. S.). *E. subfulvata*, Winshill (G. B.), Barrow (G. A. S.), common on railway banks near Little Eaton (G. B.) *E. plumbeolata*, Little Eaton, common (G. B.). *E. isogrammaria*, one at Burton (G, B.), Derby and Breadsall (G. B.). *E. castigata*, Burton (E. B. and W. G.), Repton Shrubs and Hoofies Wood (G. B.), Barrow (G. A. S.), Cloud Wood (C. F. T.). *E. trisignaria*, Repton Shrubs, common (G. B.), Cloud Wood, common (C. F. T.). *E. fraxinata*, Burton and Derby (G. B.), Burton, at light (C. F. T.), Barrow (G. A. S.). *E. pimpinellata*, Derby (G. B.). *E. valerianata*, Repton Shrubs, common (G. B.), Derby (G. B.). *E. indigata*, Breadsall Moors (G. B.). *E. nanata*, Breadsall Moors, common (G. B.), Cannock Chase (G. B.). *E. subnotata* and *vulgata*, common throughout the district. *E. albipunctata*, Repton Shrubs and Breadsall Moors, common (G. B.). *E. absinthiata*, Willington, on ragwort (C. F. T.), Cloud lime quarry, on tansy (C. F. T.), Barrow (G. A. S.), Breadsall Moors (G. B.). *E. minutata*, Breadsall Moors, common (G. B.). *E. assimilata*, Burton (E. B.), Branstone Road (C. F. T.), Newton Road (J. T. H.), Bretby (G. B.), Linton (J. T. H.), one at Barrow (G. A. S.). *E. tenuiata*, one in Repton Shrubs (C. F. T.), Breadsall Moors (G. B.). *E. lariciata*, Bretby (T. G.), once in Seal Wood (G. B.), Breadsall Moors, common (G. B.). *E. abbreviata*, Burton (E. B. and W. G.), Repton Shrubs (G. B. and C. F. T.). *E. exiguata*, common throughout the district. *E. sobrinata*, Burton (E. B. and C. F. T.), Derby (C. F. T. and G. B.), Ashby (G. A. S.). *E. pumilata*, Derby, on ragwort (G. B.). *E. rectangulata*, common throughout the district.

Lobophora halterata (*hexapterata*), Henhurst (E. B. and W. G.), Repton Shrubs (G. B. and J. T. H.). *L. viretata*, Parsons Brake (J. E. N.). *L. carpinata* (*lobulata*), Henhurst (E. B.).

Thera variata, one on Branston Bridge (J. E. N.), Breadsall Moors, common (G. B.).

Hypsipetes ruberata, one in Hoofies Wood (C. F. T.), Winshill Lane

(G. B.). *H. trifasciata*, Burton (E. B.), Newborough, common (J. T. H.), Repton Shrubs, common (G. B.), Repton Rocks (T. G.), Barrow (G. A. S.). *H. sordidata* (*elutata*), common throughout the district.

Melanthia bicolorata (*rubiginata*), Knightley Park (E. B.), Seal Wood (J. T. H.), Repton Shrubs, common (G. B.), Repton Brook (W. G.), Barrow (G. A. S.), Oakedge Park (T. G.). *M. ocellata*, Henhurst (E B.), Branston road and Bretby Park, (J. E. N.), Barrow (G. A. S.). Breadsall Moors (G. B.), Burton (C. F. T.), Rugeley, common (R. F.), Cannock Chase (T. G.). *M. albicillata*, Knightley Park (E. B. and W. G.), Repton Shrubs (C. F. T., &c.), Seal Wood (J. T. H. and J. E. N.), Decoy plantation, Bretby (T. G.), Ashby (G. A. S.), near Ashborne (H. F. G.).

Melanippe hastata, Seal Wood (E. B. and J. T. H.), Rugeley, not common (R. F.). *M. tristata*, Rugeley, common (R. F.). *M. sociata* (*subtristata*), Seal and Grange Woods (E. B. and W. G.), Oakedge Park (T. G.), Drakelow (J. T. H.), Bretby Park (T. G.), Repton Shrubs (G. B.), Barrow (G. A. S.), near Foremark (H. F. G.). *M. montanata*, common throughout the district. *M. galiata*, Breadsall Moors, scarce (G. B.). *M. fluctuata*, common throughout the district.

Anticlea rubidata, Barrow (G. A. S.). *A. badiata*, common throughout the district. *A. nigrofasciaria* (*derivata*), Burton (E. B. and W. G.), Tatenhill Lane (C. F. T.), Ashby (G. A. S.), Derby (G. B.), Bretby, not common (T. G.), near Ashborne (H. F. G.).

Coremia designata (*propugnata*), Burton (E. B. and W. G.), Drakelow (J. T. H.), Bretby Park, Hoofies Wood, and Repton Shrubs (G. B. and T. G.), Barrow (G. A. S.), Oakedge Park (C. F. T. and T. G.). *C. ferrugata*, Burton (E. B. and W. G.), one in Burton churchyard (J. T. H.), Barrow (G. A. S.), Derby (G. B.). *C. unidentaria*, common throughout the district.

Camptogramma bilineata, common throughout the district. *C. fluviata*, some specimens taken by the Rev. F. M. Spilsbury, near Willington (J. T. H.).

Phibalapteryx vittata (*lignata*), formerly at Willington (W. G.), taken by Peel's Cut, Burton, some years ago (J. T. H.), Little Eaton (G. B.).

Triphosa dubitata, common throughout the district.

Eucosmia certata, Burton, 1885 (C. F. T.), one at Barrow (G. A. S.).

Scotosia rhamnata, Dovedale (E. B. and G. B.).

Cidaria miata, Dovedale (G. B.). *C. corylata*, Bretby Park (C. F. T.), Hoofies Wood (G. B.), Repton Shrubs (G. B. and T. G.). *C. truncata* (*russata*) and *C. immanata*, common throughout the district. *C. suffumata*, Burton, not uncommon (E. B.), Repton Rocks (W. G.), Bretby (T. G.), Repton Shrubs (G. B.), Tatenhill Lane, not uncommon (C. F. T.), Barrow (G. A. S.), Breadsall Moors (H. F. G.). *C. silaceata*, Henhurst (E. B., J. T. H., and W. G.), Repton Shrubs (G. B.), Decoy plantation, Bretby (T. G.). *C. prunata*, Burton, common (E. B.), in gardens (W. G.), formerly at Burton (C. F. T.), occasionally (J. T. H.), Ashborne (H. F. G.). *C. testata*, Barrow (G. A. S.), Breadsall Moors (G. B). *C. populata*, Burton (E. B.), Breadsall Moors, common (G. B.). *C. fulvata*, common throughout the district. *C. dotata*, Burton (E. B. and W. G.), Barrow (G. A. S.), one in Henhurst (G. B.), fairly common at Bretby (T. G.). *C. associata* (*dotata*) common in gardens.

Pelurga comitata, Burton (E. B.), Shobnall (J. T. H.), Stapenhill and Willington (C. F. T.), common (G. B.).

Eubolia cervinata, not uncommon (E. B. and W. G.). Burton (C. F. T.), Shobnall, common (J. T. H.), Barrow (G. A. S.), Brizlingcote (G. B.). *E. limitata* (*mensuraria*), common throughout the district. *E. plumbaria*, Cannock Chase and Dovedale (E. B.), Barrow (G. A. S.), Tatenhill (T. G.), Breadsall Moors (G. B.). *E. bipunctaria*, Dovedale (E. B. and J. T. H.).

Carsia paludata, sparingly at Dovedale (J. T. H.).

Anaitis plagiata, Ashby (G. A. S.), Cloud lime quarry (C. F. T.), Dovedale (H. F. G.), once on Breadsall Moors (G. B.).

Chesias spartiata, Burton (E. B.), on railway banks at Willington (J. E. N.), formerly at Stenson Gorse (C. F. T.). *C. rufata*, one at light at Burton (P. B. M.).

Tanagra atrata (*chærophyllata*), Henhurst, common (E. B.), in mowing grass (W. G.), canal bank, near Willington (J. E. N.), Bretby and Bagot's Parks (T. G.), very abundant near Ticknall (J. T. H.), Dovedale, common (G. B.), Dydon Wood, near Ashborne (H. F. G.).

PYRALIDES.

Aglossa pinguinalis, common in stables.

Pyralis glaucinalis, Burton (E. B.), Branstone Road, abundant (J. T. H.), abundant at Willington, 1865 (W. G.), once at Derby (G. B.). *P. farinalis*, common throughout the district.

Scoparia ambigualis, common throughout the district. *S. cembræ*, Bretby, common (J. T. H.), one on Ashby Road (G. B.). *S. dubitalis* (W. G.), Cannock Chase, commom (T. G.), Bretby Park (T. G.). *S. conspicualis*, Repton Shrubs (G. B.), wood near Uttoxeter (J. Sang). *S. murana*, Burton (E. B. and J. T. H.). *S. ingratella*, Parsons Brake [?] (C. F. T.). *S. frequentella*, Burton (E. B.). *S. truncicolella* (G. B.). *S. pallida*, railway cuttings (W. G.).

Nomophila noctuella (*hybridalis*), in pastures at Newton (W. G.), in clover fields at Newton (J. T. H.), once at Burton (G. B.), once in Bretby Park (T. G.).

Pyrausta aurata (*punicealis*), Dovedale (G. B.). *P. purpuralis*, Knightley Park (E. B.).

Herbula cespitalis, Repton Park (W. G.).

Ennychia cingulata, Dovedale (E. B.).

Endotricha flammealis, once at Derby (G. B.).

Eurrhypara urticata, common throughout the district.

Scopula lutealis, *S. olivalis*, and *S. prunalis*, common throughout the district. *S. ferrugalis*, once at Willington, October, 1865 (W. G.).

Botys ruralis (*verticalis*), common throughout the district. *B. fuscalis*, Drakelow (E. B.), scarce (W. G.), common at Derby (G. B.).

Ebulea crocealis, Drakelow (E. B.). *E. sambucalis*, common throughout the district.

Pionea forficalis and *Cataclysta lemnata*, common throughout the district.

Paraponyx stratiotata, Burton (E. B. and C. F. T.), Repton (W. G.), Derby (G. B.), common (J. T. H.).

Hydrocampa nymphæata and *H. stagnata*, common throughout the district.

Acentropus niveus, Trent, near Burton (E. B.), Trent, at Willington (W. G.), abundant some years on Trent, at Burton (C. F. T.).

PTEROPHORI.

Chrysocoris festaliella, Henhurst (E. B.).

Platyptilia ochrodactyla, (W. G.). *P. gonodactyla* (*trigonodactyla*), near Gresley Common (J. T. H.), Ashby Road, abundant (G. B.).

Amblyptilia acanthodactyla, one at Willington (W. G.), one at Burton (G. B.).

Mimæseoptilus bipunctidactylus, (W. G.). *M. pterodactylus*, Burton (E. B.), Shobnall marl pit, common (G. B.).

Œdematophorus lithodactylus, Drakelow (E. B. and G. B.), near Burton (W. G.).

Pterophorus monodactylus, common throughout the district.

Leioptilus tephradactylus, Breadsall Moors (G. B.).

Aciptilia tetradactyla, Burton (E. B.). *A. pentadactyla*, common throughout the district.

Alucita hexadactyla (*polydactyla*), common throughout the district.

(To be continued.)

A ROYAL CHARTER FOR THE ENTOMOLOGICAL SOCIETY OF LONDON.

AT a meeting of the Entomological Society, held 5th August, 1885, Mr. J. Jenner Weir, Vice-President, in the chair.

Mr. J. W. Dunning, at the invitation of the Vice-President, announced that the Society's application for a Royal Charter had been successful. He held in his hand the Charter which had been granted by Her Most Gracious Majesty, and begged leave to present it, and formally place it in the custody of the Society.

The document was then read by the Secretary, and was as follows:—

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith. TO ALL TO WHOM these presents shall come Greeting:

WHEREAS JOSEPH WILLIAM DUNNING, of Lincoln's Inn, in the County of Middlesex, Barrister-at-Law, Esquire, Master of Arts, formerly Fellow of Trinity College, Cambridge, Fellow of the Cambridge Philosophical Society and of the Linnean and Zoological Societies of London, has by his Petition humbly represented unto US, That in the year 1833 certain of our loyal subjects formed themselves into a Society for the Improvement and Diffusion of Entomological Science, and subscribed and expended considerable sums of money for such purposes, and have collected and become possessed of a valuable library and other property, and have been and continue to be actively employed in promoting the objects for which the said Society was founded, especially by the publication of Volumes of Transactions composed of Original Memoirs, read before the Society. AND WHEREAS the said Petitioner, believing that the well-being and usefulness of the said Society would be most materially promoted by obtaining a Charter of Incorporation, hath therefore, on behalf of himself and the other Members of the said Society, most humbly prayed that WE would be pleased to grant a Royal Charter for incorporating into a Society the several persons who have already become Fellows, or who may at any time hereafter become Fellows thereof, subject to such Regulations and Restrictions as to US may seem good and expedient. NOW KNOW YE that WE, being desirous of encouraging a design so laudable, and of promoting the improvement and diffusion of Science in all its branches, have of Our especial Grace, certain Knowledge and mere Motion, given and granted, and We do hereby give and grant, That the said JOSEPH WILLIAM DUNNING and such others of Our loving subjects as are now Fellows of the said Society, or who shall at any time hereafter become Fellows thereof in pursuance of the provisions of this Our Charter and according to such Bye-Laws as are hereinafter mentioned, shall be a Body Corporate by the name of "The Entomological Society of London," having perpetual succession and a common seal, with power to sue and be sued in their Corporate name, and to acquire and hold any goods and chattels whatsoever.

And our Will and Pleasure is, That JOHN OBADIAH WESTWOOD, Esq., *Master of* Arts, Hope Professor of Zoology in the University of Oxford, shall be Honorary President of the said Corporation during the term of his natural life. And that ROBERT MACLACHLAN, F.R.S., shall be the first President of the said Corporation and shall continue such until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we do hereby declare, that there shall always be a Council to direct and manage the concerns of the said Corporation. And that the thirteen persons, who were elected to form the Council of the said Society at the Annual Meeting held in the month of January last, shall form the first Council of the said Corporation, and shall continue in Office until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we further grant and declare, that the existing Bye-Laws of the said Society, as revised and amended at a General Meeting held on the 2nd day of May, 1883, shall be the Bye-Laws of the said Corporation, until the same shall be revoked or altered as hereinafter mentioned. And that it shall be lawful at General Meetings of the said Corporation to revoke or alter any former Bye-Laws, and to make such new Bye-Laws as shall be deemed useful and necessary for the regulation of the said Body Corporate.

Provided always: And we lastly declare it to be Our Royal Will and Pleasure, That no Bye-Law or Resolution shall, on any account or pretence whatsoever, be made by the said Corporation in opposition to the general scope, true intent, and meaning of this Our Charter or the Laws and Statutes of this Realm, and that if any such Bye-Law or Resolution shall be made, the same shall be absolutely null and void.

In Witness whereof We have caused these our Letters to be made Patent.

WITNESS Ourself at Westminster the twentieth day of July, in the Forty-ninth year of Our Reign.

By Warrant under the Queen's Sign Manual.

THE SEAL.

The Vice-President congratulated the Fellows, as he might now call them, on the position which the Society had attained, and on the privileges which had been granted. He invited remarks.

Mr. Dunning said there was one thing in connection with the Charter of which he could not allow the Society to remain in ignorance. When, in 1883, it was decided to take action in the matter, he had invoked the assistance of our member, Mr. Frank Crisp, and left the conduct of the affair entirely in his hands. He thought the result which had been announced was a sufficient justification of the step. In truth Mr. Crisp had taken the burden upon himself, and relieved the speaker from all trouble. Now that the object had been obtained, Mr. Crisp had, with characteristic generosity, written to say that he has no charges whatever against the Society. He therefore moved that the hearty thanks of the Society be given to Mr. Crisp for his valuable and gratuitous services. This was seconded by Mr. Stainton, and carried unanimously. The Secretary was instructed to communicate the vote to Mr. Crisp, who was not present at the meeting.

Jonkherr May, while gladly acknowledging Mr. Crisp's kindness, thought that it was only Mr. Dunning's modesty which induced him to take this means of diverting attention from his own share in obtaining the Charter. It was to Mr. Dunning also that the Society was indebted, and he moved that the hearty thanks of the Society were due, and should be given to him. Mr. Meldola seconded the motion, and it was carried unanimously.

Mr. Dunning, in acknowledging the vote, said that when temporarily occupying the chair, some six years ago, he had said, "Incorporation by Royal Charter is not beyond our hopes." It was only a passing thought, and he had little expectation that the hope would so soon be realised. To himself, it was an unmixed pleasure to have been instrumental in obtaining that which alone was wanting to complete the fabric of the Society, and give it that status to which its history of fifty years afforded a claim, the justice of which has now received such graceful recognition. Hitherto we have been only a fortuitous concurrence of atoms; now we have a legal existence, and are a body corporate, one and indivisible, and, as far as any human thing can be, perpetual. But if our privileges have increased, so also have our responsibilities; and those responsibilities can only be discharged by the united efforts of the individual members who in the aggregate form the Society. We have to take care that the future of the Society shall be worthy of its past, that by the constant introduction of new blood our body shall never grow old, but shall with ever-renewed vigour march with the times, welcoming and aiding in every advance of Science, and shall for many an age to come unite under one banner the Entomologists of the whole Realm over which the Granter of our Charter rules.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Papilio machaon, &c., at Wicken Fen.—At the end of June I paid a flying visit to Wicken Fen under the most favourable conditions. There had been little rain, and the prevailing wind having been N.E., some of the most marshy parts were accessible. My visit, although short, showed me that *Papilio machaon* was far from dying out, as I observed a very considerable number, although difficult to capture, owing to the nature of the ground. Several I noticed of large size, one measuring three inches and a half across the wings, but many were considerably torn and bruised, so that I had a difficulty in getting a good series. I also found the larva, some of which I have succeeded in feeding up; also the larva of *Saturnia carpini*, and in the hedgerows *Liparis chrysorrhœa*. The usual method of lamp and sheet was unsuccessful, owing probably to the wind being from the N.E. I obtained *Meliana flammea*, *Hydrelia uncula* (*unca*), and found *Hyria muricata* (*auroraria*) in fine condition, although not plentiful.—Ernest Joy; 15, Brownswood Park, N., Aug. 10.

Colias edusa at Ware.—On August 4th I captured, in the fruit garden here, a fine female specimen of *Colias edusa*.—George H. Tite; Amwell House, Ware, Herts.

Colias edusa near Lyndhurst and at Sevenoaks.—I captured a large female specimen of *Colias edusa*, in good condition, near Lyndhurst. I have also taken two specimens here, one on the 2nd and the other on the 16th of this month.—Lewis F. Hill; Sevenoaks, August 22nd, 1885.

Argynnis latona (lathonia) at Brighton.—I caught a good specimen of the above-named species on the north side of Brighton race-course, on the road leading over the downs to Ovingdean, in the afternoon of the 3rd August. It was flying over a patch of wild flowers and thistles, settling on a clover flower just before I took it.—N. P. Fox; 12, Marine Square, Kemp Town, Brighton.

Habits of Vanessidæ on emergence. — In the 'Entomologist' (xv. 188, 260) I called attention to a singular habit of *Apatura iris* upon emerging from the puparium,—to wit, its clinging to the empty case with the head uppermost for five or six hours, and then reversing the position (still keeping hold of the chrysalis) and remaining with head down and wings upward for a similar time. In answer to my request for information as to the habit of other butterflies upon emergence, Mr. P. N. Pierce, of Liverpool, gave his experience with *Vanessa io* and *V. urticæ*, and *Erebia medea*, and he has now kindly furnished me with notes concerning two more, viz., *V. cardui* and *V. polychloros*. "*V. cardui*," he writes, "emerges generally in the early morning. On emerging it clings to the head of the pupa-case, hanging down with its body in a horizontal position; wings hanging quite straight down; when dry it leaves the case. *V. polychloros* seems to be like *A. iris*, with the exception of the clinging to the pupa-case. It emerges early in the morning, leaves the pupa-case and crawls up the branch, and remains with the wings hanging down; but, unlike *V. cardui*, which clings to the pupa-case in a horizontal position, *V. polychloros* assumes the perpendicular, with its head uppermost. After remaining about seven to nine hours it reverses its posture, still keeping the perpendicular, only with its head downward and wings up for five or six hours." There must be some reason for the reversal in position. What is it? Possibly that suggested by Mr. Pierce is the correct one,—that the wings being somewhat weighty drag more when hanging down than if reversed. The subject is certainly interesting, and I trust that other lepidopterists will contribute information upon it.—Joseph Anderson; Chichester.

Lycæna bellargus (adonis). — At the time Newman's 'British Butterflies' was written nothing seems to have been known (in so far as concerns our own country) of the life-history of *Lycæna bellargus* (*adonis*). I should be much obliged if some one would tell me whether since the publication of this work the larva has been discovered, and any account or description of it given in entomological journals. — Joseph Anderson, jun.; Chichester.

Lycæna corydon in Epping Forest.—I took a specimen of the above insect near Loughton on the 29th July last, on a swampy spot covered with rushes. As Newman in his 'British Butterflies' states that he took several there, I suppose there is nothing unusual in this occurrence; but although I have worked the Forest for five years, I have never before taken this insect there.—E. B. Bishop; 3, Primrose Terrace, George Lane, *dford*, August 15, 1885. [It is unusual.—J. T. C.]

ACHERONTIA ATROPOS AND COLIAS EDUSA AT CHICHESTER.—The larvæ of *Acherontia atropos* have been plentiful upon potatoes in this district. One which I had was entirely minus the usual caudal appendage, the place where the tail should have been being decorated with two bright yellow spots and a perpendicular black streak. *Colias edusa* has also appeared in some numbers in fields of clover, the periodical visits of these two species seeming to be coincident.—JOSEPH ANDERSON, jun.

ACHERONTIA ATROPOS IN SOMERSET.—Although resident here since 1867 I have not met with the "death's-head" larva till this year. The first was brought to me on August 10th, another on the 16th, two on 22nd, one on 23rd, and one on 24th. Two have since gone below ground, three seem full-fed, and the other seems much younger. They came from gardens in different parts of the town.—W. MACMILLAN; Castle Carey, Somerset.

SPHINX CONVOLVULI.—On August 11th I captured a very fine specimen of *Sphinx convolvuli*. Is not this a very early appearance? In September, 1875, I captured six specimens, but have not seen one since then until this year.—W. G. NASH; Clavering, Essex, August, 1885.

OCNERIA DISPAR AT MAIDENHEAD.—Whilst looking over some insects captured at Maidenhead during the last few years by the Rev. E. de Ewer, I noticed a male specimen of *Ocneria dispar*, which flew to a lighted window at Craufurd College some three years ago. It is well known to our best collectors that this species has not occurred in a natural state in England for many years past; I believe that the last record is that of a larva taken by myself on sallow at Cherry Hinton, near Cambridge, some ten years since (see Skertchley's 'Fenland Past and Present.'). It would be interesting to know whether any of your readers have come across this species of late years without publicly recording its occurrence.—(Rev.) GILBERT H. RAYNOR; Rosemont, Maidenhead, Aug. 5, 1885.

ERASTRIA VENUSTULA.—In reply to Mr. Geo. V. Elstowe (Entom. xviii. 201), I am afraid, as far as my experience goes, that the larva of this beautiful little moth is a fearful cannibal, as I tried to breed some this year, but with very indifferent success. I started with a fine batch of fifty larvæ, and each time I changed their *food* the number decreased until I am now left with six only. Their shape is most singular, the first segments being humped, so that when stretched out on the side of the jar in which they are fed they present a curious tadpole appearance. I tried to feed them upon knot-grass, bramble-blossom, and *Tormentilla*, but they refused everything but the latter, and of that only the flowers and seed-heads. Judging from what I have observed, it would be a most difficult larva to find by searching, as it drops from the food at the slightest noise, and curls itself up into a compact ring, after the manner of a sawfly larva.—J. A. Cooper; Sussex Cottage, Harrow Road, Leytonstone, Aug. 4.

Eremobia ochroleuca abundant at Gravesend.—Between the 29th July and the 15th August, at flowers of *Centaurea scabiosa*, in a lane near Chalk, Gravesend, I found *E. ochroleuca* quite commonly. Although most of the specimens were much worn I was able to secure a few in fairly good condition. Next to *Plusia gamma* it was the commonest Noctua at the flower-heads. In the same lane, during the present season, I have taken *Conchylis straminea* (*stramineana*) and *Euchromia purpurana*.—F. G. Whittle; 2, Cambridge Terrace, Lupus Street, S.W.

Unusual Dates for Lepidoptera.—The following instances, taken from other notes, of the appearance of Lepidoptera which seem to be out of their usual time, may perhaps be interesting:—1881, September 15th, *Argynnis aglaia*, fine female, in S. Wales. 1882, July 11th, *Lycæna minima* (*alsus*) (alone), Somersetshire, perfect condition. 1883, October, first week, *Abraxas sylvata* (*ulmata*). 1884, September 12th, *Epione apiciaria*, just emerged, South Wales; September 19th, *Cidaria testata*, fresh specimens amongst dwarf sallows on sea-coast; October 14th, *Gortyna ochracea* (*flavago*), Dorsetshire, in perfect condition. 1885, January 26th, *Xylina ornithopus* (*rhizolitha*), Somersetshire; February 24th, *Xylocampa areola* (*lithorhiza*); April 24th, *Melanthia ocellata*, just emerged; June 17th, *Gonopteryx rhamni*, nine months of existence.—T. B. Jefferys; Clevedon, July, 1885.

Cleoceris (Epunda) viminalis and Melanippe tristata.—This year I have again had the pleasure of breeding some fine black forms of *C. viminalis*. I have also a very few of a lighter type amongst them, but when compared with the southern or New Forest specimens are much more distinctly black and white (resembling the colour of *Polia chi*) ut that ochreous or metallic shade. The insect is very sluggish; when disturbed it falls to the bottom of the box, and remains motionless for some time; in fact, I never saw one make an attempt to fly; time of emergence about 4 to 6 p.m. I am also having a second brood of *M. tristata* out just now. I do not remember seeing a record of a second appearance anywhere; this year they were very plentiful. I found them in a fresh locality close to the town.—J. Harrison; Barnsley, Aug. 8, 1885.

Pædisca oppressana in Epping Forest.—While examining the trunk of an aspen in the Forest on Bank Holiday (Aug. 3rd), a Tortrix flew off, but I marked it down; and on searching the grass I was surprised to find a tolerably good specimen of this insect. As I hear the poplar trees in its old locality have been cut down, it was very desirable a new place should be found for this very local species.—William Machin; 29, Carlton Road, Carlton Square, E., August 15, 1885.

Anacampsis (Gelechia) albipalpella.—I have bred a good series of this much-wanted species this season from larvæ collected in Epping Forest. It is a most difficult species to rear, unless the larvæ are gathered full grown, which is about the end of June or beginning of July. They can be kept in a close-fitting tin for three or four days, provided they are not allowed to get mouldy, and then the contents of the box put into a cage; and in due course the moths will emerge freely. The larvæ feed on *Genista anglica*, betraying their presence by the blotched appearance of the young shoots.—Wm. Machin; 29, Carlton Road, Carlton Square, Aug. 14, 1885.

Crambus myellus.—I am very pleased to be able to record the capture, in Glen Tilt, last month by Mr. Herd and myself, of five specimens of this rare and pretty *Crambus*.—S. T. Ellison; Perth, Aug. 7, 1885.

Tortrix viridana.—The Rev. G. H. Raynor mentions (Entom. xviii. 194) having seen numbers of rooks feeding on larvæ of *T. viridana*, in a wood near Warley, and that he had never noticed rooks feeding on these larvæ before. It might be interesting to him to hear, that when I was collecting in the wood he mentions I noticed the same thing, and likewise found several dead and dying rooks under the trees. I examined one or two, but failed to find any trace of external injury, although I noticed that they were wasted to mere skeletons. I cannot, of course, say positively that their death was caused by their diet, or whether they were suffering from an epidemic, but taking the two circumstances together it seems feasible that a plethora of food, which may have been palatable to them although perhaps injurious, may have caused their death. I should be pleased to hear if anyone has observed such an effect before. I may mention in passing that I captured a beautiful specimen of *Phoxopteryx upupana.*—J. A. COOPER; August 4, 1885.

COLEOPHORA VIBICIGERELLA, *Zell.*—I have reared one very fine specimen of this insect from larvæ found on *Artemisia maritima*, proving that the species is not confined to *A. campestris.* The case is very similar to that of *C. ditella;* black, 4½–5 lines long, six times as long as broad, somewhat compressed, sharply keeled on the ventral surface, towards the anal extremity more compressed and bent downwards, anteriorly somewhat attenuated. The position of the case slightly less recumbent than that of *C. ditella.*—WM. MACHIN; 29, Carlton Road, Carlton Square, E., August 14, 1885.

SCYTHROPIA CRATÆGELLA.—When larvæ beating in Epping Forest in October, 1884, I noticed a small crab-tree completely enveloped in a beautiful silken web, in which was enclosed a large number of minute hairy larvæ. I gathered a number of the withered leaves, and with the approach of the following spring the larvæ crawled out and fed freely on whitethorn, mining the leaves, about six or seven larvæ tenanting each leaf. After the first moult they left the mines, and fed on the leaves in the ordinary manner of a lepidopteron. When full-fed they crawled into the middle of the web, suspending themselves singly, and turned into curiously-shaped pupæ, not unlike miniature sea-horses in appearance. The larvæ when full-fed were of a brown colour, with broad yellow dorsal stripe; and the perfect insect is most sluggish, and difficult to induce to leave the web, and when shaken out quickly returns, and that even from a distance of several yards, hurrying into the web, apparently considering themselves safe only when hidden within its silken folds.—J. A. COOPER; August 20, 1885.

NOTES FROM MY DIARY.—March 31st, *Notodonta bicolor* at Orpington. June 30th, took a fine *Cossus ligniperda* at Chislehurst on a tree. July 3rd, *Chrysomela gœttingensis* and *C. staphylæa* at Chislehurst, amongst grass and nettles at the foot of a wall. July 5th, collected Hymenoptera at Bedford Park, Chiswick. Sent these and others from the same locality to Mr. E. Saunders, to whom I am indebted for the names. They are as follows :—*Trypoxylon figulus*, *Passalœcus insignis*, *Crabro podagricus*, *C. cephalotes*, *Odynerus parietinus*, *Andrœna albicans*, *Megachile circumcincta*, *Osmia rufa*, *Bombus pratorum*, *B. lapidarius*, *B. terrestris*, *Chrysis ignita*, *C. cyanea*. On another occasion I took *Belyta dorsalis*. The *Chrysides* are very beautiful insects; *C. ignita* is very common on sunny walls, but I only saw one *C. cyanea*. I should never have caught this one had it not persistently come back to the same place after being alarmed. I saw it on a window-sill, and lifted my net to catch it, but before I could strike it was gone—in an instant—I knew not where. I was just mourning its loss when there it was back again in exactly the same spot, and so three or four times, until it was captured. July 13th, *Lomaspilis marginata* came to light at Chislehurst. July 19th, took a nearly adult larva of *Vanessa cardui* on *Carduus arvensis* at Bedford Park. July 20th, an individual of *Zeuzera pyrina* (*œsculi*), female, at Chislehurst. July 25th, *Ourapteryx sambucata* and other species very abundant at gas-lamps at Roehampton, near Barnes. August 3rd, *Sesia myopœformis* on leaf of willow tree at Bedford Park. This is the third Bedford Park example I have seen. August 6th, my brother brought me a dead example of *Acherontia atropos*, which he had picked up at Chislehurst.—T. D. A. COCKERELL; 51, Woodstock Road, Bedford Park, Aug. 6.

AN APTEROUS SAWFLY.—Before passing from hymenopterous insects I may mention that, though Sawflies are not numerous in the Zarafshan Valley (Turkistan), yet there is one form particularly remarkable, for, with a normal male, related to the group *Selandriidœ*, is a female without traces of wings. Affected by this absence of wings, the thorax undergoes important changes, and appears greatly swollen, and all the females generally have the appearance of little bags. Its relation to this family is said to be astounding, since it is the only example of the wingless form in the whole family of Sawflies. All the other specialities of structure, however, as well as the wings of the male, confirm it.—(Rev.) Dr. HENRY LANSDELL, in 'Nature.'

TELENOMUS PHALÆNARUM, *Nees* (= BELENUS, *Walk*).—This small egg-parasite has been bred in some numbers from eggs of

Bombyx [illegible] found at Tenby and sent to Mrs. Hutchinson, who very kindly forwarded the batch of eggs to the writer. When received on the 23rd July a great number of the flies were out, and many eggs entire, thereby showing the inhabitants had not left their dwelling; eighteen of the eggs that were entire were placed in separate boxes, with a view of recording the number each egg contained, but I am sorry to say the flies in these and many others, on examination, proved to be dead within the egg; the number contained within each egg varied from seven to ten; the flies, when they leave the egg, do so from a single round hole. Mr. Fitch, who kindly named this species, says, "Walker described five other species, belonging to the same section of the genus. Goetze bred it from *B. castrensis* eggs, and it has several times been recorded from *P. bucephala* eggs; Nees obtained it from some large *Bombyx*, also from eggs laid on sallow and from poplar." About four years since I found six eggs of of *S. ocellatus*; these were infested with an egg-parasite. Some of the genus are solitary in their attacks.—G. C. Bignell; Stonehouse, Plymouth, August 15, 1885.

Microgaster alvearius.—I have this day bred the extraordinary number of one hundred and thirty-three from a larva of *Boarmia gemmaria* (*rhomboidaria*) found on jessamine at Laira. I have on a former occasion obtained ninety-five, and thought that was a great number to be supported by the unfortunate victim; but now obtaining an additional thirty-eight I think it worth recording.—G. C. Bignell; August 21, 1885.

Mimicry.—In the ably written article on "Mimicry" in Insects, by Mr. Trimen in the 'Entomologist' for March, 1885, I notice that he says the term "Mimicry" was first used by Mr. Bates as applied to the insect world. Now in Kirby and Spence's 'Introductory Letters to Entomology,' published in 1815, the word is frequently used, as for instance, on page 5:—"Nay sometimes this *Mimicry* is so exquisite that you would mistake the whole insect for a portion of the branching spray of a tree." I merely quote this, as Kirby and Spence have done more for Entomology than most men, rescuing and elevating it, at a time when to study insects was thought to be indicative of a weak mind, and assisted it to become what it is now, one of the first and most delightful and interesting of studies. *Palmam q* [illegible] *t.*—Geo. Barnard; Queensland, May 12, 1885.

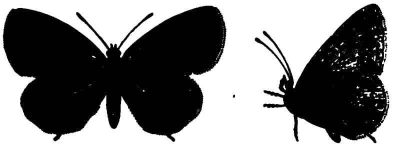
THE ENTOMOLOGIST.

Vol. XVIII.] OCTOBER, 1885. [No. 269.

LYCÆNA ARGIADES, Pall.

A BUTTERFLY NEW TO THE BRITISH FAUNA.

By the Rev. O. Pickard-Cambridge.



Lycæna argiades.
(From a continental specimen.)

Two specimens (male and female) of this butterfly, which appears to be new to Britain, were taken on Bloxworth Heath, Dorset, on the 18th and 20th of August. The female (which is rather worn) was taken on the 18th by my son Charles Owen, and the male on the 20th, close to the same spot, by my son Arthur; this latter specimen is in good condition. Repeated searches in the neighbourhood since have failed to bring any further success. One of the plants on which I understand the larva feeds, great bird's-foot trefoil (*Lotus major*), is abundant near the spot where these two specimens occurred; and it seems to me probable that we have chanced upon the last of a small brood of this pretty little butterfly. It is stated, in Kirby's 'European Butterflies and Moths,' to occur from May to August. I am in hope, therefore, that by searching for it early another season we may obtain more specimens. When captured it is easily enough distinguished by the little tails to the hinder wings, and the markings on under side, in which last it much resembles *L. argiolus;* but when on the wing I doubt whether the most experienced collector would distinguish it with any certainty either from a slightly worn or dull example of *L. icarus* (*alexis*) or from *L. ægon*, both of which species abound on and near the spot where we found *L. argiades*. I did not myself see the female before its capture, but my son thought it was *L. ægon;* and I do not doubt but I should have thought so myself. The male I saw as it flew up lazily (the sky was cloudy at the moment) from among the grass, less than a yard from where I was boxing another insect. I could not distinguish it then from *L. icarus;* but I called to my son Arthur to catch it, which he did at once; and in less than two minutes it was recognised and safely boxed. In our subsequent searches we have captured and examined (and for the most part either pinned for cabinet use or deported to a distance and released) over 500 *icarus* and *ægon*. The spot is one I have gone over constantly for many years, both collecting insects and in ordinary walks, and should never have thought of taking the trouble to catch anything looking so like a worn or dark *icarus* or *ægon*. This, presuming upon one's knowledge of what one's own district contains, is perhaps the reason why many a rare insect is passed over, until some such accident as the eagerness of a beginner to catch everything he sees, turns it up, and makes the old collector look rather small. Mr. Frederick Bond's opinion is that poor *icarus* will now have a bad time of it, when the occurrence of so similar an insect is made known. Doubtless it will be so; and I hope the result may be to turn up *L. argiades* in many other localities on our southern coasts. From a large fine specimen of the male *icarus*, however, I think the male of *argiades* may easily be distinguished on the wing; and the female will be probably also found to be of too brown a hue to be mistaken for the ordinary varieties of *icarus;* but certainly all the dark lilac varieties of *icarus*, male (which includes all worn examples), as well as nearly all males of *ægon*, must be caught and examined to make it certain that *argiades* has not been passed over. Perhaps future experience may show us some peculiarity in flight by which to distinguish the species when on the wing, or some information on this point may be obtained from continental collectors where *argiades* is abundant.

The following is a short description of the two specimens now recorded:—

LYCÆNA ARGIADES, *Pall.*

Kirby's 'European Butterflies and Moths,' p. 53, pl. 14, fig. 11:—

Male.—Width, 12⅔ lines; upper wings much more rounded than those of *L. icarus*, and rather more than those of *L. ægon*. Colour lilac-blue, lighter or darker according to the incidence of the light upon the wings, and narrowly edged with black; the hinder wings have a small prominent point on the hind margin, near the inner corner, continued in a small, slender, but quite distinct, black, white-fringed tail; outside the tail, near to and parallel with the margin of the wing, are two not very distinct black spots. The wings are somewhat transparent, and the nervures are distinctly marked by fine dusky black lines; the fringes of the wings are pretty perfect, and appear to be a mixture of black and white. All the wings are dusky blackish towards the margins, but not distinctly bordered like *L. ægon*. The under side is whitish gray, silvery blue towards their insertion in the thorax; two distinct orange spots edged above with black are placed about the middle of the hind margin on the under side of the posterior wings, one of these (immediately above the tail) has a largish distinct black spot at its base; a few small black spots are scattered over the rest of the under side of the posterior wings, and a row of others, some of which are rather elongate, runs parallel with the outer margin of the anterior wings, and between this row and the margin, and also parallel with it, are some indistinct dusky markings.

Female.—Width, 13 lines. Upper wings dusky blackish brown, sprinkled with some lilac scales towards their base; lower wings similar, but with more of the lilac scales, which form a kind of broad and widening lilac band from the base to the outer margin; a black spot occurs close to the "tail," with a round orange spot immediately above it. The tail is similar to that of the male.

I gather from Kirby's 'European Butterflies and Moths' that the male also usually has an orange spot visible on the upper side near the tail; and that those specimens wanting it (like the example here recorded) form the variety *L. coretas*, Ochs.

Bloxworth Rectory, Wareham, Sept. 7, 1885.

PS.—Since correcting the proof of the above I have ascertained, beyond a doubt, that an example of *Lycæna argiades* was also taken near Bournemouth, on the 21st of August this year, by Mr. Philip Tudor. This specimen was named, but doubtfully, for him by Mr. MacRae, of Bournemouth, as a worn example of *L. bætica;* but on my yesterday showing Mr. MacRae (who first informed me of the above capture) the description of *L. argiades*, here given, with the woodcut figure above, he at once admitted that Mr. Tudor's specimen was not *L. bætica*, but *L. argiades;* and a letter received last night from my eldest son (who is a fellow-pupil of Mr. Tudor's, at Forest School, Walthamstow) informs me that he had just seen a specimen of *L. argiades* in the collection of Mr. Tudor, taken at Bournemouth in August, and thought by Mr. Tudor to be *L. bætica*, but which was identical with our specimens of *L. argiades*. The Bournemouth locality is fourteen miles from that of our captures. I have given the above with perhaps unnecessary particularity; but I think the records of additions to our British Fauna cannot be too particular or too accurate.—O. P. C.; September 16, 1885.

[Dr. Lang, in his 'Butterflies of Europe,' from which the above figures are reproduced, says:—"From May to the end of August in Central and Southern Europe (except Britain and Spain), North Western Asia, and South of Siberia, and the Amur. It frequents meadows, and is generally a common insect. There are two or three broods in a year; the individuals of the spring brood are smaller than those which appear later in the season. Larva feeds on trefoil and other Leguminosæ." Mr. W. F. de Vismes Kane, in his new 'Handbook of European Butterflies,' also gives "May to August, according to latitude, with successive broods in the south." *Lycæna argiades* will be placed in our collections between *L. bætica* and *L. ægon.*—Ed.]

ON BREEDING THE VARIETIES OF THE ORANGE-MOTH (*ANGERONA PRUNARIA*).

BY GEO. J. GRAPES.

IN the summer of 1882, at Colchester, Essex, from a few pupæ of this insect I obtained, in due course, ova, and subsequently larvæ, which hybernated during the following winter, secreted among withered leaves of sallow, on which tree they had been feeding. Before hybernation they attained a length of about three quarters of an inch, and were of the ordinary whitish or greenish gray colour, characteristic of the larvæ of the normal type of *A. prunaria.* These, with few exceptions, survived the winter, and produced many series of fine imagines.

Having been so successful in breeding this species, the idea occurred to me of pairing some of them with the orange-banded variety of the male, specimens of which I was fortunate in securing rather plentifully at dusk, on the outskirts of an adjacent wood, about midsummer, 1883. In this instance, also, I succeeded in hybernating the larvæ, which varied in colour from pale gray to almost black, apparently according to the variety typified; and in the ensuing summer my efforts were rewarded by the acquisition of several fine examples of the varieties of both sexes, *viz.*, two varieties of the male,—one, deep orange, suffused with unusually dark fuscous irrorations, in some instances slightly confluent; and the other, light fuscous crossed with bright orange bands; and the ordinary variety of the female, *viz.*, plain brown, with light yellow transverse fascia.

This continued success induced me to try the effect of the undermentioned experimental pairings:—Normal female with orange-banded var. male; var. female with orange-banded var. male; var. female with normal male; from which I obtained many more fine examples of the brown varieties of *A. prunaria*, as well as a few aberrations, including an exceedingly pale one, in which the fuscous or brown colour was of the faintest tint, indeed barely discernible, though the outlines of the transverse yellow bands were sufficiently distinct to identify the female variety; also a variation of the normal type of the same sex, in which the ground colour was of the typical yellow, but the dark striated spots larger and more distinct than usual. The last I managed to pair with an orange-banded variety of the male, and effected other pairings, as enumerated below:—Var. female with speckled var. male; var. female with orange-banded var. male; normal female with orange-banded var. male; normal female with speckled var. male; var. female with orange-banded var. male; var. female with speckled var. male; speckled var. female with orange-banded var. male. Though I secured a plentiful supply of ova from these pairings, I was able only to save about fifty larvæ. The others either escaped through the fine meshes of the muslin sleeve in which they had been confined, or were destroyed by young spiders which overran my garden in the early part of the season.

With this small stock, however, as *prunaria* is reputed to be a very variable moth, I hope, on a future occasion, to be able to chronicle some new variations of this lepidopteron worthy of special note.

2, Buckleigh Road, Streatham Common, S.W., Sept. 15, 1885.

AN UNUSUAL APHIS MIGRATION.

By John R. S. Clifford.

Somewhat to my surprise, it appears that as yet no observations have been communicated to the 'Entomologist' concerning the Aphis migration that took place towards the end of July and at the beginning of August, and which must have been noticed by many naturalists, since it evidently extended over some considerable part of England; at least I have had reports of it from Surrey and Oxfordshire. The presumption is, therefore, justifiable that it occurred in other counties. Concerning Kent and Middlesex I can speak from personal observation. It is to be hoped that notes illustrative of this event may yet be contributed to this and other scientific journals, as we might thereby be helped to a better knowledge of a group of insects that are interesting on account of their peculiar economy, and also their pernicious influence on vegetation, especially on the produce of our gardens, both useful and ornamental.

re, however, describing this particular incident, it is necessary to refer to the usual rule of Aphis migration. It is known to entomologists that these insects are viviparous and wingless through the greater part of the season, when obviously migration is to them a thing impossible. The periods of their migration are towards the close of May or early in June, and corresponding dates in September or October, the Aphides being then winged. In answer to a communication of mine, the late Francis Walker remarked that the time of these migrations depends upon the state of the atmosphere, and in this way: so long as the plants upon which the Aphides are feeding afford them an abundant supply of sap they multiply rapidly, but when a change in the weather checks the flow they come forth winged, and are also prompted to change their quarters. There is then actually some truth that on certain cloudy oppressive days of spring and autumn "there is a blight in the air," according to the popular belief, for it is on such days that Aphides travel. The insects are seldom noticeable on any day when there is a strong wind blowing, and I do not think that direction makes any difference, though the statement has been made that easterly winds brings the Aphides; but I have found them on the move in winds from all parts of the compass; yet it is true that the east wind, from its unkindly effects on vegetation, will bring about that check to healthy growth which develops the flying brood; nor does the Aphis suffer from this wind as do many insects; rain, however, is greatly disliked by them. As to the distance they generally journey, Mr. Walker added that their migrations, he believed, were short; but the word as applied to distance is somewhat indefinite; if we have no standard of comparison, it might mean a mile or a few hundred yards. I take it Mr. Walker meant a distance approximating to the latter space. Yet I hope to demonstrate that Aphides may and do travel, at least on some occasions, a mile, and even more, though I cannot give support to the theory of one naturalist that they may not only go from county to county in Britain, but cross to us from the Continent, or *vice versâ*. Though if we speak of flight, *i. e.*, of voluntary motion, an examination of the wings of an Aphis suggests that they could sustain the insect for but a brief time; it seems as though when they make a long journey through the air they must allow themselves to be simply borne along by the current, whichever way it may blow. It is not probable that they form themselves into a compact body for such journeys; but they certainly move in parties.

Nothing remarkable occurred, so far as I am aware, at the first or later spring migration of 1885; but the migration of July and August was notable for the number of Aphides that were on the wing in some counties, and the period during which this migration continued,—certainly about a fortnight in North Kent. Of course in this time the wind blew from various quarters, but chiefly from the N.N.W. and N.E. Concerning the species I am not able to speak positively; that there were several thus migrating I fully believe, but on most days two were particularly recognisable, *viz.*, a green Aphis, which seemed to correspond with *Aphis humuli* or its variety *malaheb*, an insect which, though named from the hop, occurs upon fruit trees, the rose, and a variety of plants. The other was smaller, and a blackish species, resembling, if not identical with, *Myzus cerasi*, occurring upon the cherry and allied plants. By far the greater number were of the green sort; probably on most days there were six or eight of these to one of the darker insects. I have not an exact date, but it was about July 20th when the Aphides appeared notably in the roads and lanes of North Kent, the number varying from day to day. Sometimes after a short walk an individual would be seen with as many as thirty or forty Aphides dotted over his garments; and they entered the eyes and ears occasionally, causing annoyance or even alarm. Circumstances led me to walk across the metropolis, on Wednesday, July 29th, from Commercial Road, E., to Belgravia in the west, and all the distance I found Aphides floating in the air. This, however, is no proof that at the time a wave of Aphides, so to speak, was passing across the country, scattering stragglers as it moved. I only infer from it that the Aphides of the suburban gardens were afflicted with the same restlessness that their country kin showed.

At Gravesend the climax of this migration was reached on Saturday, August 1st, when the swarms of these insects was a subject of common remark amongst those in the streets; and they were most numerous of all at the foot of High Street and upon the shore adjacent. An investigation of the line of their movement made the fact undoubted that they must have crossed us from the Essex coast; how far they had travelled inland iously can only be conjectured vaguely; but they must have travelled at least a mile over the water; and as it does not seem likely they intended to settle in or about the town, I suppose that some of the Aphides seen flying two or three miles inland, and moving from the north, had been bred in Essex. That a great many died during this migration appears certain, for I do not find that any place near Gravesend is usually infested with them, though the hop gardens here and there have suffered from "fly," as happens most years.

The change of weather that occurred after the August bank holiday terminated the Aphis migration; and it was followed by the appearance, also in good force, of their natural enemies the "lady-birds," more especially *Coccinella septempunctata*. I did not observe, however, these beetles passing through the air in any number, though I have in former years; and once saw the church of Ifield, in Kent, covered with thousands of *C. bipunctata* that had been driven against it by stress of weather. It need only be added that the cause of this migration of Aphides is obvious: it was assuredly induced by the long-continued drought, which forced the insects into the winged form, and prompted them to travel in search of vegetation more juicy than that they had left, a journey which could have been but partially successful to the tiny travellers.

Gravesend, September 7, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias edusa.—This butterfly seems to be plentiful this year. In a small piece of clover, about an acre and a half, I took twenty fine fresh specimens in about an hour on August 18th, and five more on August 24th.—(Rev.) J. Seymour St. John; Whatley Rectory, Frome.

Colias edusa near Newark.—This species has made its appearance in this neighbourhood after many years absence, several specimens having been captured near Newark in the early part of this month.—J. W. Tomlinson; Stamp Office, September 14, 1885.

Colias edusa and Eremobia ochroleuca near Cudham, Kent.—I captured two specimens of *Colias edusa* (male and male yesterday, September 22nd, near Cudham. I also took in the same locality, on the 9th of last August, a very perfect specimen of *Eremobia ochroleuca* at rest on the stem of knapweed. I see in this month's number of the 'Entomologist' (vol. xviii., [illegible]) that Mr. [illegible] mentions having found it commonly near Gravesend; therefore Kent may be given as a locality, as well as Sussex, Gloucestershire, Suffolk, and Yorkshire are given as localities for this species in Newman's 'British Moths.' *Pyrameis cardui* and *V. atalanta* have been abundant this autumn in West Kent.—F. W. Frohawk; 1, Park Place, Eltham, Kent, Sept. 22.

Colias helice and Sphinx convolvuli at Chichester.—On August [illegible] I took a fine *Colias helice* flying over a clover field. The specimen is a peculiarly white one. During the first week in September several *Sphinx convolvuli* visited the flower-beds in our garden, and one evening two flew into the dining-room, when the gas had been lighted. One specimen (which my brother captured) is in such splendid condition that apparently it had but recently emerged from the pupa.—Joseph Anderson, jun.; Chichester.

Acherontia atropos at Harwich.—The larva of this moth has occurred here in some numbers this year. I have already had five brought to me, and have heard of others being destroyed. Three have buried themselves; the other two are still feeding.—F. Kerry; Harwich.

Acherontia atropos in Huntingdonshire.—Two correspondents having drawn attention (Entom. xviii. 243) to the number of *Acherontia atropos* larvæ found in their district, I may say I have experienced a similar increase in numbers in Huntingdonshire. For three weeks I have had one, two, or three larvæ brought me each day. This is unusual, but owing probably to the fine weather.—H. E. Norris; St. Ives, Hunts, Sept. 2, 1885.

Sphinx convolvuli.—I have come across two specimens of this moth this year. One was sent me by a relation from the Isle of Wight, having been caught at Bembridge about August 20th; the other was taken at Wells, September 3rd, and was brought to Dr. Livett, of that city, who kindly gave it to me.—(Rev.) J. Seymour St. John; Whatley Rectory, Frome.

Sphinx convolvuli at Christchurch.—On August 14th I had a fine male *S. convolvuli* brought to me, which had flown into a room in the street a few days before. Since then I have received four. One deposited four eggs the night before I received it, which were unfortunately thrown away; and although I kept it until it died it did not lay any more. I have heard of several others being taken near here.—A. DRUITT; Christchurch, Hants, September, 1885.

SPHINX CONVOLVULI AT ROTHERHITHE.—I have taken a good specimen of this moth here. It flew into an oil shop, in the Lower Road, on the evening of August 28th, probably attracted by the gas-light, and settled on the wall.—A. E. COOK; 31, Lower Road, Rotherhithe, S.E.

SPHINX CONVOLVULI AT HOLLOWAY.—A specimen was brought to me alive on September 5th, having been caught in my immediate neighbourhood, and, although captured by a novice, not a scale was disturbed; in fact it looked as if it had just emerged from the pupa. The specimen has been seen and identified by Mr. Cooke, Naturalist, of Museum Street.—J. P. MUTCH; 359, Hornsey Road, Holloway, London, September 15, 1885.

SPHINX CONVOLVULI NEAR CHICHESTER.—Whilst looking at some moths taken this year by two young entomologists, of the ages of ten and nine years respectively, in the parishes of Westhampnel and East Lavant, I was pleased to see that each had taken a specimen of this *Sphinx*, one being taken in each parish.—FRANCIS C. WOODBRIDGE; Lewes, Sussex.

SPHINX CONVOLVULI AT LEICESTER.—It is with pleasure that I am able to record the capture of two specimens of *Sphinx convolvuli*. One, a very fine specimen, was caught on a door in early morning of August 31st; it is a very fine specimen, and at the time of capture could not have been long out of pupa. The other, badly crushed, was brought to me by some men on the 5th inst.: they were both taken near the centre of the town. These are two of the very few captures as yet recorded from Leicestershire. — W. TRISTRAM; Havelock Cottage, Gosling Street, Leicester, Sept. 13, 1885.

SPHINX CONVOLVULI AT NORTHAMPTON.—On Sept. 5th I was fortunate enough to capture four good specimens of *Sphinx convolvuli*, and four more during the next week. All were caught in the same locality, namely, in a nursery outside the town, in which there was a fine bed of sweet-scented tobacco plant, which seemed very attractive to these moths. A friend also caught two at the same place, and I myself saw several more, which I did not attempt to take, having sufficient for a good series. I may add that this moth is rarely taken in this town; the only one I have heard of before these, was caught by a workman in a gentleman's garden two years ago.—F. Bostock, jun.; Trentham House, Billing Road, Northampton, Sept. 19, 1885.

Sphinx convolvuli near Maidstone.—I have not seen a single specimen of this insect since 1875, when I was fortunate enough to secure five in my own and a neighbour's garden. Last evening, however, a noble male specimen was brought to me by one of my parishioners, who had caught it in his house, attracted doubtless by light.—(Rev.) S. Cave-Browne; Detling Vicarage, Maidstone, September 5, 1885.

Sphinx convolvuli near Footscray and Sidcup.—On the 6th of September I saw a fine male *S. convolvuli* hovering at a lily in my garden, which I failed to capture, but succeeded in decapitating the lily. On the following evening I visited a neighbour's garden, where there is a large bed of petunias, and succeeded this time in taking one, as I did also on the following dates,—8th, 9th, 10th, 11th, and 14th. My friend Mr. Hickling, of Sidcup, also took three fine specimens from fences. Two were sent me by a friend, taken at Sunbury.—James Trimmer Williams; Footscray, Kent, Sept. 15, 1885.

Sphinx convolvuli at Walthamstow.—I am pleased to record that a very fresh specimen of this fine species was brought to me on August 24th last, having been taken on a door-knocker in this locality.—O. G. Goldthwaite; Walthamstow.

Sphinx convolvuli in Somerset.—A specimen of this insect was captured here at rest on August 28th, and another flew into a cottage on September 6th. I have not met with it previously.—W. Macmillan; Castle Cary, Somerset.

Sphinx convolvuli and Chœrocampa celerio in Surrey.—*Sphinx convolvuli* for the last fortnight has been, I may say, a common insect in this locality. While watching them to my surprise I noticed *Chœrocampa celerio;* and after several attempts during the last fortnight I have at last taken specimens.—J. Venables; Woodlands, Henley, Surrey, Sept. 17, 1885.

Sphinx convolvuli and Chœrocampa celerio at Cromer.—I have pleasure in recording the capture of three specimens of *Chœrocampa celerio*, one of which was taken by myself, another by my brother (who has given it to me), and another by the chemist here; the two former ones were taken hovering over a bed of petunias, and the latter flew in at the shop window. *Sphinx convolvuli* has also appeared in great numbers; I have taken sixteen in very good condition, twelve of which I took in three evenings.—F. H. Barclay; The Warren, Cromer, Norfolk, Sept. 19, 1885.

Sphinx convolvuli and Chœrocampa celerio at Lewes.—On September 11th I caught a fine specimen of *Chœrocampa celerio* flying over a bed of petunias in our garden. I have also taken five specimens of *Sphinx convolvuli* at the same bed this autumn, and three others have been taken by my brother and a friend; the first was caught on August 14th.—William E. Nicholson; Lewes, Sussex.

Sphinx convolvuli and Chœrocampa celerio at Dovercourt.—On the 31st August I was fortunate enough to secure a specimen of *S. convolvuli* at rest. On the 13th September a fine specimen of *C. celerio* was brought to me alive. It was caught whilst flying in the bar of the Queen's Head Hotel, Dovercourt. It is nearly perfect.—F. Kerry; Harwich.

Chœrocampa celerio.—An exceptionally fine specimen of this handsome moth was found on my drawing-room window on 12th September, 1885. So fine is it that it must have only just emerged from pupa.—Henry Benson; Kylemore, Pevensey, Sussex, September, 1885.

Chœrocampa celerio at Ramsgate.—I have just seen two specimens of this insect, which were taken near Ramsgate by some young friends, and brought to me for confirmation. One is in very fine condition; the other a trifle worn.—Theodore Wood; Freeman Lodge, St. Peter's, Kent, Sept. 19, 1885.

Chœrocampa celerio in London.—I have to report the capture of a specimen of this rare insect on Blackfriars Bridge, London (where it was found at rest by a man employed in our city office) on Friday morning, September 11th. It was brought to me alive, but had suffered somewhat from clumsy handling.—

Oliver C. Goldthwait; 2, Grove Villas, Grove Road, Walthamstow, Sept. 19, 1885.

Chœrocampa celerio, &c., at Christchurch.—On the 19th September, at dusk, I took a small male specimen of the above insect, hovering over geraniums in my garden: it is in fine condition. I also took one specimen each of *Luperina cespitis* and *Eremobia ochroleuca* during August last.—J. Mortimer Adye; Somerford Grange, Christchurch, Hants.

Chœrocampa celerio at Crosby.—On Friday, Sept. 19th, a scholar of the Merchant Taylors' School, Crosby, brought me a specimen of *Chœrocampa celerio*, which he had caught on the 16th. He found it in his garden at Crosby, struggling in a spider's web. It is in very good condition. Not being a collector he presented it to me.—Geo. A. Harker; Holden Road, Blundellsands, Lancashire, September 21, 1885.

Chœrocampa celerio in North Wales.—I was fortunate enough to capture a fine specimen of this moth on Sept. 18th at rest on a window-sill. I think this is the first reported occurrence of this rare *Sphinx* in North Wales.—W. J. Kerr; Tan-y-Bwlch, Merioneth, North Wales.

Chœrocampa celerio at Holmwood.—In my garden, at Holmwood, a lady, while on a visit, captured a fine specimen of *Chœrocampa celerio* on the palings. It is now in my collection. —T. W. King; Bude Haven, Holmwood, Surrey, Sept. 14, 1885.

Chœrocampa celerio at Felixstowe.—A fine specimen of this rare moth was captured at Felixstowe, on September 14th, by a friend of mine, who, not being a collector, sent it to me.—H. Miller, jun.; Ipswich.

Deiopeia pulchella at Folkestone.—I have to record the capture of a fine female *Deiopeia pulchella* at Folkestone, near the harbour, on the 7th September.—D. Chittenden; Willesborough, Lees, Ashford, Kent, September 13, 1885.

Agrotis præcox, &c., near Cambridge.—On August 7th I captured a specimen of *Agrotis præcox*: it came into my room about 10 p.m., evidently attracted by light. With the exception of a small rent in the right lower wing, it was in excellent condition. The nearest point of coast is about forty miles from there. Is not this rather an unusual distance inland for such a coast moth? On August 28th a female *Hepialus humuli* emerged in my breeding-cage. The larva had been feeding about a month before in the stem of the water-figwort (*Scrophularia aquatica*). I saw one male of *Colias edusa* near Wivelsfield, Sussex, last month.—G. E. CRALLAN; Fulbourn, near Cambridge, Sept. 8.

LIPARIS MONACHA AT TUNBRIDGE WELLS.—I was surprised to find, a few days ago, a female specimen of this moth on the cricket-ground on this common, as I have never heard of it being taken about here before, and September is rather late for it to be on the wing. The specimen was much worn.—G. H. K. BONE; 3, Hungershall Park, Tunbridge Wells, Sept. 18, 1885.

OCNERIA DISPAR IN WARWICKSHIRE.—I was much interested at seeing in the September 'Entomologist' (xviii. 243) the account by the Rev. Gilbert H. Raynor of the occurrence of this moth at Maidenhead, as I was fortunate enough, whilst collecting in Warwickshire about the middle of last May, to find twelve of the larvæ feeding on hawthorn in a hedgerow in the neighbourhood of Rugby. They were at the time of feeding very small indeed, and at first I failed to recognise them. Out of the twelve two died soon after I found them, and also another just before they all spun up. This took place at the end of June, the moths emerging at the end of the following month. Out of the nine, four were females and five males; and I succeeded in obtaining over fifty eggs.—W. H. BLABER; Beckworth, Lindfield, Sussex, September 4, 1885.

[Is it not possible that these larvæ are introduced from the Continent with the immense number of "quick-set hedge" (hawthorn) plants which are annually imported into this country by the wholesale nurserymen?—ED.]

ASTHENA BLOMERI.—Entomological books, so far as I know, give this insect as single-brooded in the same month. I should be glad to hear from any of your readers if they have ever known a succession of emergences during the season. In the same place, close by this house, I took a specimen on May 28th; one, June 6th; another, June 9th; a fourth, July 13th; and a fifth, August 24th; all of them being fresh and perfect specimens. Possibly the long dry summer may have had something to do with this exceptional occurrence.—(Rev.) J. SEYMOUR ST. JOHN; Whatley Rectory, Frome.

HELIOTHIS PELTIGERA, &c., IN YORKSHIRE.—Several days
my friend Mr. W. E. Clarke, of Leeds, sent me a moth to iden
which he had taken on the 6th of the present month (Septem
at Kilnsea in Holderness. It was with great pleasure I at
saw it was a well-marked specimen of *Heliothis peltiger*
species quite new to the county of Yorkshire; and, so far
know, not previously recorded as occurring so far nort
Britain. Mr. Clarke found the specimen at rest on the s
hills, and it had evidently not flown since its emergence from
pupa. On August 31st I found larvæ of its commoner rela
H. marginata, in great abundance on *Ononis arvensis*, on
cliffs, about four miles north of Scarborough. On August
a fine example of *Sphinx convolvuli* was taken, by Mr. H
Stevenson, in the town at Huddersfield.—GEO. T. PORR
Huddersfield, September 14, 1885.

OCHSENHEIMERIA VACCULELLA IN EPPING FOREST.—On Au
3rd (Bank Holiday) I made a short journey to the Forest,
while there I thought I would look over the bole of an oa
which I had several times taken *Laverna stephensiella*. W
closely examining the bark I observed, deep in a crevice,
appeared to be an insect (for at rest they so closely resembl
colour the bark as to be hardly recognisable), which, on b
touched, moved further in. I cut away the bark and insert
small pill-box, and endeavoured with a grass-stem to work
insect into the box; and, when I had all but secured my p
it crept into a small hole from which some coleopterous i
had emerged and disappeared. On removing some web I
covered two others, but, as it was impossible to reach them
a box, I tried to work them out with grass-stems, but on b
brought near the surface they skipped off and were lost.
their habits were so different from that of *O. birdella*, whi
had met with at Southend by sweeping grass, I thought
might prove to be the rare *O. vacculella*, and felt particu
anxious to make a captive. I worked at the tree for a coup
hours, and was rewarded with half a dozen specimens. Th
forwarded to Mr. Stainton, who, with his usual kindness, n
the specimens for me. The principal characters of *O. vacc*
are the whitish base of the posterior wings, and the ant
perfectly simple, with no erect scales.—WILLIAM MACHIN
Carlton Road, Carlton Square, E.

NOTES FROM ABBOT'S WOOD.—Having heard that Lepidoptera were plentiful in the above locality I joined my brother, on the 20th June, for a few days' collecting. He had been there a week, and from the reports I had received I anticipated a fair amount of work, and am glad to say I was not disappointed. On the 21st we walked through some of the ridings of the wood prospecting, and were pleased to come across a freshly emerged female of *Melitæa athalia* at rest on a flower of hawkweed. *Argynnis selene* was plentiful, but getting worn; *Thecla rubi* had been common, and faded specimens were not infrequent, especially in the White Field; while *Hesperia sylvanus* and the commoner species were in fair numbers. A single specimen of *Gnophria rubricollis* and four pairs of *Zygæna trifolii* were also taken, and ova obtained from the latter. On the 22nd we went into the wood in the hope of taking *M. athalia*, but although the morning broke bright and sunny, clouds gathered just as its habitat was reached, and none were to be seen. However, by scouring amongst its food-plant, the common cow-wheat (*Melampyrum pratense*), which grows here in large masses, we were able to add six fresh specimens to one we had already taken in the White Field. A visit to Eastbourne the next day produced *Lycæna minima* (*alsus*), fairly common on the cliffs about Holywell; with *L. bellargus* (*adonis*) and *L. icarus* (*alexis*) further on towards Beachy Head. The 24th proved a genuine midsummer day, hot and almost cloudless, and *M. athalia* appeared on the wing in some abundance. We again took a single specimen in the White Field, and filled our boxes in the course of a couple of hours or so with a nice series of picked specimens. A noticeable feature in the habits of this species on the wing is its occurrence in little companies of from two to four or more, so that single specimens were the exception. The 27th, also proving fine and sunny, we paid a further visit to its head-quarters in order to take some females, and were pleased to find a few couples at rest on grass-stems, although the proportion of females taken was only 20 per cent. Other species seen included a hybernated female of *Colias edusa*, *Euchloe cardamines* (which was quite three weeks late), *Dasychira pudibunda*, *Timandra amataria*, *Melanippe hastata*. Among larvæ by far the most common was *Eriogaster lanestris*, which occurred in large numbers on the blackthorn, some of the "nests" containing over by larvæ: and examples were to be seen on palings, walls, &c. *Bombyx quercus*, *B. neustria*, *Saturnia pavonia* (*carpini*), and *Dicranura vinula* were, amongst others, noticed; and an oak twig covered with eggs proved to be those of *D. pudibunda*; whilst an erratic female, *B. rubi*, had deposited a batch of eggs on a black fence by the railway station. Many other common species were in fair numbers.—F. W. Hawes; Dovecote Villas, Wood Green, August 15, 1885.

Captures in Berkshire.—During last July, and at other times, I have collected at Beaumont (Berks), and have noticed a good many not generally common insects there. *Sphinx convolvuli* has been twice taken within the grounds; and last July I obtained a specimen of *Boarmia roboraria*, which came to light. I saw a specimen of *Thecla pruni*, which I was unable to capture. A large specimen of the beetle, *Prionus coriarius*, was taken on the wing at night, and brought to me.—Edmund Gardner; Roehampton Lane, S.W., September, 1885.

Stray Notes from Preston.—This season I have reared a number of *Nepticula anomalella*, a few *Coccyx scopariana*, *Hedya servillana*, and seven or eight *Cidaria reticulata*. My captures are but few. In a few hours, at Windermere, I got four *Heliozela resplendella*, one *Nepticula internella*, one *Phoxopteryx diminutana*, some *P. biarcuana*, &c. At Grange, during the same week, I took twenty *Catropia aspidiscana*, and a dozen *Pancalia leuwenhoekella*. Of butterflies, I took only *Leucophasia sinapis*, *Argynnis euphrosyne*, and *Lycæna argiolus*. During another day at Windermere, which I had in July, I captured a score or so of *Scoparia conspicualis*, and a few *S. basistrigalis*, one *Cidaria reticulata*, *Venusia cambrica*, &c. On an odd day at Witherslack, in the second week in July, I took three *Eupœcilia amandana* (*sodaliana*), flying round buckthorn, about 7 p.m., when I saw others. On the bank by the inn I took *Phothedes captiuncula* (*expolita*), and, on the same day, *Oxyptilus parvidactylus*, and other species, were in plenty. During a few weeks in August I was too unwell to collect any insects; but at Blackpool I got about fifty *Eupœcilia atricapitana*, some *Choreutes myllerana* (*scintillulana*), and *Ephippiphora populana* (*ephippana*) by hundreds. *Sericoris littoralis*, a single specimen feeding by daytime on ragwort flowers. *Agrotis vestigialis* (*valligera*), *A.*

cursoria, and *Miana literosa*, flying in hot sunshine, with an occasional *A. præcox*.—J. B. Hodgkinson; 6, Fishergate Hill, Preston, Sept. 7, 1885.

Timarcha lævigata.—On Sept. 9th of this year, at Pegwell Bay, Thanet, I came across an immense number of this common beetle. They were among the grass and small shrubs on a little stretch of ground on the edge of the chalk cliffs. They were in such numbers that there seemed to be one on almost every square foot of ground.—Edmund Gardner; Roehampton Lane, S.W., September, 1885.

Notes on Insects at the Lighthouses in 1884.—Under date of June 30th, Mr. Owen Boyle, of the Larigard lighthouse, reports, "A skylark, followed by a string of bees. The plaintive cries of this poor bird first attracted my attention; it flew so close that I almost caught it; it was closely pursued by a large number of bees, and in its fright took to the water, followed by its pursuers. When last seen it was making for the Essex coast." July 31st, at 10.14 a.m., "A cloud of mosquitoes pitched in this neighbourhood, similar to those seen in India; most of them were carried off at noon by a light breeze." Mr. Chas. Williams, of the Hanois lighthouse, Guernsey, says, under date of July 10th:—"A great quantity of large ants, with wings, passing; a great many settled on the rocks and about the lighthouse. I have only once seen them before like this, when I was stationed at the South Bishop Rock, off the coast of Wales." Heligoland, by Mr. Gätke:—"Night, July 2nd to 3rd, thousands of *Plusia gamma;* 3rd, myriads of dragonflies; night, 21st to 22nd, great numbers of *Bombyx neustria*, east to west; 22nd to 23rd, the same; 27th to 28th, numerous flights passing on."—From the '*Report on the Migration of Birds*, 1884'; communicated by John Cordeaux, Secretary to Committee.

Abundance of Aphides at Peterborough.—On Thursday the central streets of the town were rendered impassable with any amount of comfort, owing to the air being thickly laden with myriads of green flies, in some parts almost resembling a mist. The town air seemed in the long-run to upset them, for they were late in the day to be seen covering the ground to nearly an inch in depth. The Corn Exchange had just been repainted, and acted as an admirable flycatcher, causing some amount of amusement to all except the contractor, who was compelled to pumice-stone their corpses off to make the place presentable.—'*Stamford and Rutland Guardian*,' August 14, 1885.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—An ordinary meeting was held at the Society's rooms, 1, Denman Street, Southwark, S.E., September 3rd, 1885, the President, Mr. R. South, in the chair.

Mr. J. Jenner Weir exhibited some very interesting specimens from the Kalahari Desert, South Africa, captured there by Mr. Farini, *viz.*, species of Arachnida, Orthoptera, the curious toad-grasshopper, *Batrachotettix bufo*, also a species of *Mantis*, and a piece of a sand-hill, containing some of the white ants by which it was formed. Mr. Weir briefly referred to the peculiarities of habit and structure of the insects exhibited.

Mr. Janson, who was present as a visitor, exhibited a specimen of *Sphinx convolvuli*, taken on the knocker of a door in Victoria Road, Finsbury Park; and Mr. Gurney, also a visitor, a fine variety of *Chelonia caia*, in which the spots of the hind wings unite and form a band.

Mr. South exhibited some curious varieties of *Zygæna filipendulæ*, *Chelonia caia*, *Abraxas grossulariata*, and *Lycæna icarus* (*alexis*) var. *icarinus;* and communicated some interesting notes on the Lepidoptera of Folkestone.

Mr. Billups read a short paper on Homoptera, which he illustrated with numerous specimens; the same gentleman also brought insects in the orders Coleoptera, Orthoptera, Diptera, and Hymenoptera.

Mr. Adkin (Vice-President) exhibited a fine series of *Dicranura furcula* and *Pseudoterpna pruinata* (*cytisaria*), bred, and *Acidalia inornata*. Mr. Chaney showed a box of Coleoptera, and Mr. Cook a box of Lepidoptera.

Mr. Hall exhibited a striking variety of *Abraxas grossulariata*, the only variety bred from 380 larvæ, some 180 of which were ichneumoned. Mr. Helps brought larvæ of *Lophopteryx camelina*, Mr. Hickling a strongly-marked specimen of *Argynnis aglaia*, and Mr. W. A. Pearce a box of Lepidoptera.

Mr. Wellman exhibited a fine series of *Eupithecia rectangulata* var. *nigrosericeata*, and specimens of *Psamotis pulveralis*, *Acidalia strigilaria*, and *Gnophos obscuraria* var. *calceata*. Mr. J. T. Williams exhibited *Sphinx* convolvuli, a series of bred *Plusia chryson* (*orichalcea*), *Oxyptilus distans*, and *Mimæseoptilus plagiodactylus*. —**Walter A. Pearce**; Hon. Sec., Lyndhurst, Croxted Road, West Dulwich.

REVIEW.

The Transactions of the Entomological Society of London for the Year 1884.

The Transactions for the past year fully sustain the reputation which this Society has attained amongst the learned societies of the world. The volume for 1884 contains twenty-five memoirs; of these eleven relate to Lepidoptera (one of which is partly on Hymenoptera), three to Coleoptera, five to Hymenoptera, one to Hemiptera, three to Diptera, one on the caprification of figs, and one on the *Pediculus melittæ* of Kirby, and its affinities, with reference to the larvæ of *Meloë*.

The Transactions extend to 517 pages; and the Proceedings, including the able address of the retiring President, Mr. Dunning, to 45 pages. They are illustrated by fifteen plates.

Of the papers relating to Lepidoptera, Mr. Elwes deals in an admirable manner with that widely distributed and most difficult genus *Colias*.

Mr. Poulton's "Notes upon, or suggested by, the colours, markings, and protective attitudes of certain lepidopterous larvæ and pupæ, and of a phytophagous hymenopterous larva," form a very welcome contribution to philosophical natural history. They are illustrated by a beautiful coloured plate.

Mr. Meyrick's two memoirs on the classification of Australian *Pyralidina* are excellent. The author has also had the advantage of observing the species in their native localities.

Lord Walsingham contributes a most valuable memoir on North American Tortricidæ, illustrated by an accurate coloured plate of sixteen species.

Mr. Forsayeth's memoir on the "Life-history of sixty species of Indian Lepidoptera," illustrated by a coloured plate, contains the result of long and patient observation, and will be read with interest by all entomologists.

There are other memoirs on Lepidoptera of great merit by Messrs. Miskin, Lionel de Nicéville, Butler, and Moore.

The papers on Coleoptera are two by Mr. David Sharp, in his usual painstaking manner, on "The water-beetles of Japan," and a "Revision of the Hydrophilidæ of New Zealand"; and one by Mr. Sidney Olliff, on the life-history of a *Cassida* from Brazil.

The most important of the memoirs relating to Hymenoptera is that by the Treasurer, Mr. Edward Saunders, forming the third part of the "Synopsis of British Hymenoptera-aculeata, *Apidæ*." It is needless to say that this is written with the usual acumen of that careful author. Mr. E. Saunders contributes also "Further notes on the terminal segments of Aculeate Hymenoptera"; Mr. Bridgman, "Further additions to Mr. Marshall's Catalogue of British Ichneumonidæ"; Mr. Hockings, "On two Australian species of *Trigona*"; and Mr. Cameron, "Descriptions of new species of Tenthredinidæ and Cynipidæ from Mexico."

Mr. Douglas contributes the only memoir relating to Hemiptera, "On a new species of the genus *Orthezia*." This is written in the careful manner characteristic of the author, whose habits of close observation are so widely known; and is illustrated by a plate showing these minute insects magnified.

Mr. Kirby contributes some "Notes on the Diptera of New Zealand"; and Baron Osten-Sacken, "Facts concerning the importation or non-importation of Diptera into distant countries." This paper is of great interest. The Baron also contributes a very philosophical memoir on comparative Chætotaxy, or the arrangement of characteristic bristles of Diptera.

Lastly, there are those two remarkable memoirs, read by Sir Sidney Saunders, on the "Caprification of Figs" and "On the *Pediculus melittæ* of Kirby, and its affinities, with reference to the larvæ of *Meloë*." The latter, as stated by the President in his address, was an "abstruse and closely-reasoned communication," read by one of the original members of the Society in the seventy-fifth year of his age, and within less than a fortnight of his death.

The President concluded his notice of the late Sir Sidney Saunders with the following remarks, in which all who had the pleasure to know him will concur:—

> "Thus from 1834 to 1884 Sir Sidney Saunders was a contributor to our Transactions, and all his important memoirs have appeared in the Society's publications. It has been truly said that his published writings were far too few to represent his extensive knowledge of our science.

I cannot doubt, however, that many of his memoirs, *e.g.*, those on the Stylopidæ or bee-parasites, on the brier-insects, the fig-insects, and other Hymenoptera, will have an enduring value and preserve him from oblivion. His carefulness and accuracy in observation and research, his kindly encouragement of those who needed it, and his unfailing courtesy to all, combined to constitute a man with whom it was a pleasure to be associated; and to us at least, who have known him personally, and been allied with him as Members of this Society, the memory of our late colleague will continue ever green."

The Proceedings are replete with valuable short communications, too numerous to be dealt with here. Amongst them is one that should not be passed over, *viz.*, Miss Ormerod's communication on the warble-fly, *Hypoderma bovis*, so destructive to the hides of bullocks. Prof. C. V. Riley, who was present at the discussion of the subject, stated that the larvæ might be destroyed by the application of kerosine or mercurial ointment to the backs of the cattle attacked.

At so important a period in the history of the Entomological Society, it may be desirable to give a very brief account of its origin and progress.

In pursuance of Resolutions adopted at a preliminary meeting, held on 3rd May, 1833, at which were present N. A. Vigors, Esq., M.P., J. G. Children, J. E. Gray, G. R. Gray, J. F. Stephens, and W. Yarrell, Esqrs., Revs. F. W. Hope and G. T. Rudd, and Dr. Horsfield, the organisation of the Entomological Society was effected; and the first general meeting was held at the Thatched House Tavern, St. James's Street, on 22nd May, 1833, J. F. Stephens, Esq., in the chair, when the Council and Officers were elected and appointed, as follows:—Honorary President—Rev. William Kirby, M.A. President—J. G. Children, Esq., Sec. R.S. Vice-Presidents—N. A. Vigors, Esq., M.P., D.C.L., F.R.S., Dr. Horsfield, F.R.S., J. F. Stephens, Esq., F.L.S. Treasurer (and Vice-President)—Rev. F. W. Hope, M.A., F.L.S., &c. Secretary—G. R. Gray, Esq. Curator—G. R. Waterhouse, Esq. The other members of the Council were—A. H. Davies, Esq., F.L.S., &c., J. E. Gray, Esq., F.R.S., &c., A. W. Griesbach, Esq., B.A., E. Newman, Esq., F.L.S., &c., Lieut.-Col. Sykes, F.L.S., &c., W. Yarrell, Esq., F.L.S., &c.

On 4th November, 1833, W. Spence, Esq., F.R.S., was elected an Honorary English member; and W. B. Spence, Esq., was appointed Foreign Secretary to the Society. The late Dr. Charles Darwin was one of the original members of the Society, which was supported also by most of the eminent naturalists of the day. At the meeting held 1st June, 1835, the President announced that their Royal Highnesses the Duchess of Kent and the Princess Victoria had been graciously pleased to become the Patronesses of the Society; and a letter from Sir John Conroy was read to that effect. It will, therefore, be seen that when Her Gracious Majesty granted a Royal Charter to the Society on 20th July last, it was not the first time that Her Majesty had been pleased to recognise the laudable design of the Entomological Society.

The first volume of the Society's Transactions was published in 1836, and to the the year 1884 inclusive thirty-two volumes have been published, all of which contain most valuable contributions to Science.

The meetings of the Society have been well attended, and have formed a medium of personal intercommunication between not only the entomologists of Great Britain and the Colonies, but also of foreign countries; and many warm friendships between scientific men have been so brought about. Those whose knowledge of the Society's meetings extends over several decades treasure up in kindly remembrance the conversations they have had with the eminent naturalists they have met there, now no longer living; but happily what may be said of the past, can equally be said of the present, members of the Society,—so many willing and able at all times to assist in the kindest manner the neophyte, and to impart to all the knowledge that they possess; and of whom it may be truly said, "Olim meminisse juvabit."

It is very much to be hoped that the entomologists of the whole United Kingdom and the Colonies will join the Society, which has now become a National Institution; and thus enable the Council to increase the size and importance of the annual volume of Transactions.

The annual subscription is much less than that of most of the learned Societies, and the Fellows have the additional advantage of purchasing the earlier publications of the Society at a reduced rate.

THE ENTOMOLOGIST.

VOL. XVIII.] NOVEMBER, 1885. [No. 270.

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

By RICHARD SOUTH, F.E.S.

(Continued from vol. xvi., p. 77.)

MIMÆSEOPTILUS, Wallengren.

plagiodactylus, Sta.

(PLATE I., FIGS. 1 & 2.)

IMAGO. — Expanse, 9–10 lines. Fore wing gray-brown; some black scales along the costal margin, inner margin ochreous-brown. At the digital juncture is a black spot of irregular shape, and between this and the base of the wing is a black dot. Towards the apex of the outer digit is a small blackish linear spot or dash. All these markings are inconstant as regards size and intensity; especially is this the case with the digital spot, which in some examples is only very faintly indicated, and in others stands out prominently. Fringes brown, paler round the inner edge of the outer digit. The bases of the digital fringes are whitish, with a series of small patches of black scales arranged in the following order:—One at angle and one at tip of outer digit, one at angle of inner digit, and two between this and tip of inner digit. Tip of outer digit subacute, that of inner obtuse. Hind wing and fringes slightly darker than fore wing. Head and two-thirds of thorax (prothorax and mesothorax) gray-brown, remainder of thorax (metathorax) and abdominal juncture pale ochreous-brown; abdomen gray-brown. Legs gray-brown. May and June.

LARVA.—Length, 4–4¼ lines, attenuated posteriorly. Head smaller than 2nd segment, pale shining yellowish green, freckled with brownish; mandibles pale brown; a black spot on each cheek. Ground colour obscure green; segmental divisions yellowish green. Dorsal stripe reddish pink, or rose-madder, most distinct on the 9th to 12th segments, and indicated only

Mr. Gregson was again good enough to send me three full-fed larvæ on the 17th of May; and this year I received a few from him on 4th June. In the note which accompanied the last lot of larvæ, Mr. Gregson says, "The season was very late in Wales, or these should have been now appearing." Probably, therefore, as June is abnormally late, March may also be exceptionally early, and April and May are the months during which the larvæ feeding on *Scabiosa columbaria* are usually found. In this respect, then, they agree with larvæ of *Mimæseoptilus plagiodactylus.*

In some of the Welsh larvæ the dorsal area is unadorned with red of any shade, until within a short time of pupation, when the anal segment becomes slightly rosy. This was the case with larvæ received from Mr. Gregson this year (*ante*, p. 195). In every other particular they agreed with the description taken down of the larvæ sent me by this gentleman in 1881 and 1882, as they also did with larvæ received from Purdey. The moths bred from the 1881 larvæ were small strongly-marked *M. plagiodactylus*, as were also the imagines from the 1882 larvæ. Those bred this year are larger, and one or two less-strongly marked, differing not at all from the Folkestone insects.

Seeing that the characteristic markings of the larva, pupa, and imago of *M. plagiodactylus* are subject to variation, it does not appear to me matter for surprise that in some isolated localities those markings should in one stage of the insect be reduced to vanishing point or entirely absent, and in another greatly intensified. Such variation, if constant, which in this case it is not, constitutes a local form; but whilst the connecting links exist it cannot establish a species.

The strongest marked imago of *M. plagiodactylus* I have bred from larvæ received from Mr. Gregson is figured on the plate, together with figures of larva and pupa; these last were taken from examples sent in 1881. Plate I., fig. 1, imago; 1 *a*, larva feeding; 1 *b*, larva enlarged; 1 *c*, pupa enlarged; 1 *d*, food-plant (*Scabiosa columbaria*).

CNÆMIDOPHORUS, Wallgr.
rhododactylus, Fb.

(PLATE I., FIG. 8.)

IMAGO. — Expanse, 9–11 lines. Fore wing warm sienna-brown, some whitish scales at the base and along the costal margin. On the inner margin is an interrupted whitish streak. This commences near the base and is broken by the ground colour just before the middle; from this point some whitish scales on the disk of the wing form a connection with a large whitish blotch on the middle of the costa; beyond the middle a narrow whitish band runs from the costa to inner margin, parallel with the hind margin; the inner edge of this band is broadly margined with a darker shade of the ground colour. Fringes whitish, dark brown at the base, and variegated with brown at the tips, angles, and inner margins of both digits; tip of outer digit acute, inner obtuse. Hind wing, first and second feathers lustrous golden brown; third feather much shorter than the other two, dark brown, broadly whitish along its inner margin; fringes lustrous golden brown, with some whitish scales at the tip. Head, thorax, and abdomen colour of fore wing, the latter variegated with whitish; abdominal juncture whitish. Legs white, variegated at the joints with brown; spines white. July.

LARVA.—Length, 5–6 lines, slightly attenuated posteriorly, and from the 5th to 2nd segment anteriorly. Head dingy ochreous, tinged with green and freckled with pale brown; the crown spotted with dark brown; mandibles pale reddish brown, tipped with darker; a large black spot on each cheek. Ground colour yellowish green; dorsal line reddish violet, most distinct on the 2nd to 6th segments, and again on the 11th to 13th segments. Tubercles, four rows (four on each segment) of small whitish warts, each emitting a single whitish hair; subdorsal, one on each segment, with a whitish hair; spiracular, one on each segment, from which spring two diverging whitish hairs. Spiracles reddish brown, with whitish outer margins. Prolegs blackish; anal claspers semitransparent, greenish, tipped with brown. The whole body is thickly studded with short whitish bristles. Food, *Rosa*. It usually bores a hole through the upper portion of a flower-bud, and feeds on the folded petals. This habit is shown on the plate, fig. 3 *a*. Sometimes the larva may be found feeding on the stamens of a flower, the petals of which are fastened together by their outer edges with silken threads. When feeding on flower-buds the larva conceals itself by drawing down and securing a leaf to the bud. June.

PUPA.—Dingy green, with a darker dorsal line, strongly suffused with rose-colour or violet. Hairs as in the larva. The paler wing-cases stand out prominently from the thorax, thus giving the pupa a swollen appearance at this point. Attached by the anal segment to the flower-stem just below the ovary, and protected by a slight network of silk, which unites a leaf with the flower-bud. The pupa stands erect, and in this position bears a superficial resemblance to a stunted rose-bud.

Plate I., fig. 3, *Cnæmidophorus rhododactylus;* 3 *a*, larva feeding; 3 *b*, larva enlarged; 3 *c*, pupa in position; 3 *d*, pupa enlarged; 3 *e*, dog-rose (*Rosa canina*).

I was this year fortunate enough to find five larvæ of this species in one of its old localities, and felt exceedingly glad to renew its acquaintance after a lapse of seven years.

PTEROPHORUS, Wallgr.
monodactylus, L.
pterodactyla, Hb. (us), D. L

(PLATE I., FIG. 4.)

IMAGO.—Expanse, 10–12 lines. Fore wing whitish or grayish brown, in some examples pale ochreous brown; a small irregular shaped black spot at digital juncture, and a black dot between this and the base of the wing. Fringes gray-brown, with two brown dots in the apical margin of outer digit, and three black dots on the margin of inner digit (one at the tip, one at the angle, and one midway between these two). Hind wing and long silky fringes gray-brown. Head and thorax colour of fore wing. Abdomen gray-brown, with a whitish median stripe intersected by a blackish line; this latter swells out into somewhat lozenge-shaped spots at the segmental divisions. Legs gray-brown. July to April; most frequently met with in September.

LARVA.—Length, 6–7 lines, tapering posteriorly. Head much smaller than 2nd segment, pale brown, sometimes with a greenish tinge; mandibles brown, a black spot on each cheek. Ground colour dingy green, streaked and dotted with whitish, and somewhat suffused with red-brown. Dorsal stripe is dilated on the crest of each segment, forming a series of lozenge-shaped marks, either dark green or red-brown. Tubercles, two dorsal rows (four on each segment), but little paler than the ground colour, with tufts of whitish or pale brown hairs; subdorsal, one on each segment, also with a tuft of whitish or pale brown hairs; spiracular, one large transparent tubercle, with tuft of whitish or pale brown hairs on each segment, and a smaller one on the posterior edge of the 4th to 11th segments; these last have short whitish or pale brown bristles. Prolegs and anal claspers pale brown, tinged with greenish. Food, various species of *Convolvulus;* eats flowers, buds, and leaves. June to September.

PUPA.—Green at first, afterwards pale dingy brown, more or less suffused with reddish brown along the dorsal area. Dorsal and lateral lines interrupted, blackish brown; warts and hairs as in the larva, except that some of the dorsal series are blackish. Head flattened, marked with brown, and thickly covered with short hairs. Wing-cases yellowish green, faintly streaked with brown. Attached by anal segment to stem of food-plant or other object near. June to September.

Plate I., fig. 4, *Pterophorus monodactylus;* 4 *a*, larva feeding; 4 *b*, larva enlarged; 4 *c*, pupa enlarged; 4 *d*, *Convolvulus.*

margin is an interrupted whitish streak. This commences near the base, and is broken by the ground colour just before the middle; from this point some whitish scales on the disk of the wing form a connection with a large whitish blotch on the middle of the costa; beyond the middle a narrow whitish band runs from the costa to inner margin, parallel with the hind margin; the inner edge of this band is broadly margined with a darker shade of the ground colour. Fringes whitish, dark brown at the base, and variegated with brown at the tips, angles, and inner margins of both digits; tip of outer digit acute, inner obtuse. Hind wing, first and second feathers lustrous golden brown; third feather much shorter than the other two, dark brown, broadly whitish along its inner margin; fringes lustrous golden brown, with some whitish scales at the tip. Head, thorax, and abdomen colour of fore wing, the latter variegated with whitish; abdominal juncture whitish. Legs white, variegated at the joints with brown; spines white. July.

LARVA.—Length, 5–6 lines, slightly attenuated posteriorly, and from the 5th to 2nd segment anteriorly. Head dingy ochreous, tinged with green and freckled with pale brown; the crown spotted with dark brown; mandibles pale reddish brown, tipped with darker; a large black spot on each cheek. Ground colour yellowish green; dorsal line reddish violet, most distinct on the 2nd to 6th segments, and again on the 11th to 13th segments. Tubercles, four rows (four on each segment) of small whitish warts, each emitting a single whitish hair; subdorsal, one on each segment, with a whitish hair; spiracular, one on each segment, from which spring two diverging whitish hairs. Spiracles reddish brown, with whitish outer margins. Prolegs blackish; anal claspers semitransparent, greenish, tipped with brown. The whole body is thickly studded with short whitish bristles. Food, *Rosa*. It usually bores a hole through the upper portion of a flower-bud, and feeds on the folded petals. This habit is shown on the plate, fig. 3 *a*. Sometimes the larva may be found feeding on the stamens of a flower, the petals of which are fastened together by their outer edges with silken threads. When feeding on flower-buds the larva conceals itself by drawing down and securing a leaf to the bud. June.

PUPA.—Dingy green, with a darker dorsal line, strongly suffused with rose-colour or violet. Hairs as in the larva. The paler wing-cases stand out prominently from the thorax, thus giving the pupa a swollen appearance at this point. Attached by the anal segment to the flower-stem just below the ovary, and protected by a slight network of silk, which unites a leaf with the flower-bud. The pupa stands erect, and in this position bears a superficial resemblance to a stunted rose-bud.

Plate I., fig. 3, *Cnæmidophorus rhododactylus;* 3 *a*, larva feeding; 3 *b*, larva enlarged; 3 *c*, pupa in position; 3 *d*, pupa enlarged; 3 *e*, dog-rose *canina).*

I was this year fortunate enough to find five larvæ of this species in one of its old localities, and felt exceedingly glad to renew its acquaintance after a lapse of seven years.

PTEROPHORUS, Wallgr.
monodactylus, L.
pterodactyla, Hb. (us), D. L.

(PLATE I., FIG. 4.)

IMAGO.—Expanse, 10–12 lines. Fore wing whitish or grayish brown, in some examples pale ochreous brown; a small irregular shaped black spot at digital juncture, and a black dot between this and the base of the wing. Fringes gray-brown, with two brown dots in the apical margin of outer digit, and three black dots on the margin of inner digit (one at the tip, one at the angle, and one midway between these two). Hind wing and long silky fringes gray-brown. Head and thorax colour of fore wing. Abdomen gray-brown, with a whitish median stripe intersected by a blackish line; this latter swells out into somewhat lozenge-shaped spots at the segmental divisions. Legs gray-brown. July to April; most frequently met with in September.

LARVA.—Length, 6–7 lines, tapering posteriorly. Head much smaller than 2nd segment, pale brown, sometimes with a greenish tinge; mandibles brown, a black spot on each cheek. Ground colour dingy green, streaked and dotted with whitish, and somewhat suffused with red-brown. Dorsal stripe is dilated on the crest of each segment, forming a series of lozenge-shaped marks, either dark green or red-brown. Tubercles, two dorsal rows (four on each segment), but little paler than the ground colour, with tufts of whitish or pale brown hairs; subdorsal, one on each segment, also with a tuft of whitish or pale brown hairs; spiracular, one large transparent tubercle, with tuft of whitish or pale brown hairs on each segment, and a smaller one on the posterior edge of the 4th to 11th segments; these last have short whitish or pale brown bristles. Prolegs and anal claspers pale brown, tinged with greenish. Food, various species of *Convolvulus;* eats flowers, buds, and leaves. June to September.

PUPA.—Green at first, afterwards pale dingy brown, more or less suffused with reddish brown along the dorsal area. Dorsal and lateral lines interrupted, blackish brown; warts and hairs as in the larva, except that some of the dorsal series are blackish. Head flattened, marked with brown, and thickly covered with short hairs. Wing-cases yellowish green, faintly streaked with brown. Attached by anal segment to stem of food-plant or other object near. June to September.

Plate I., fig. 4, *Pterophorus monodactylus;* 4 *a*, larva feeding; 4 *b*, larva enlarged; 4 *c*, pupa enlarged; 4 *d*, *Convolvulus*.

Mr. G. C. Bignell, of Stonehouse, was kind enough to send me larvæ of this species on June 17th this year. Some of them were nearly full grown, others quite small. He found them in a garden feeding on the small garden convolvulus (*Convolvulus minor*). When the supply of food sent with them was exhausted, shoots of the large convolvulus (*Convolvulus major*) were given them, which they took to readily, as also they did afterwards to the small bindweed (*Convolvulus arvensis* *). The larvæ pupated between June 26th and July 5th, and the moths appeared between the 6th and 30th of July.

I have frequently taken this "plume" in the autumn, and also in the spring. It may frequently be observed sitting on garden walls and palings. In this position its resemblance to a T-shaped bit of hay or straw is very curious. When at rest the hind pair of legs are laid along the body, the feet meeting at the end of the abdomen and resting thereon. The hind wings are folded up under the fore wings, and the inner digits of the fore wings are folded or rolled up under the outer digits, so that the fore wings are reduced to nearly half their width.

In the autumn of 1876 I observed *P. monodactylus* flying at dusk in some numbers around and about a clump of large bindweed (*Convolvulus sepium*). An examination of the plant next day resulted in the finding of several pupæ and larvæ.†

Until the present year, with the exception of hibernated specimens in the spring, I had not seen this species on the wing before the month of September. This year I netted one example at Folkestone on August 7th, and on the 29th I boxed two others from off a garden fence at Hampstead.

Hitherto *P. monodactylus* has been considered single-brooded, occurring in the larval stage in August and September, and in the perfect state in September and October, and again after hibernation in the spring. It appears, however, that there are two broods of the species in the year, although there does not seem to be any clear interval between the broods. Late imagines of the first brood may be contemporary with early imagines, certainly with larvæ, of the second brood. For this reason it would perhaps be more correct to say that there are a succession of broods between June and October. From my own observation I am inclined to think that there are but two broods, and that the periods may be approximately fixed as follows:—First brood, larva, June and July; imago, July and August. Second brood, larva, August and September; imago, September and October.

---

* In a recent note Mr. Bignell tells me that this plant also grew in the garden where he found the larvæ.

† This is not peculiar to *P. monodactylus*. Many of the Pterophoridæ are to be found as larva, pupa, and imago at one and the same time, and often on the same plant.—R. S.

Lord Walsingham, in his 'Pterophoridæ of California and Oregon,' writing of *Pterophorus monodactylus* (p. 40), says:—"One distinguishing peculiarity of this genus and species, whether in Europe or in America, by which it may always be immediately recognised, is the presence of brush-like tufts of appressed scales on the upper side of the hind feet. In good specimens these are noticeable on each of the tarsal joints below the second pair of spurs; . . . . . . it is remarkably constant, and does not occur, so far as I am aware, in any other genus of the Pterophoridæ."

PLATYPTILIA, Hb.

bertrami, Röessler.

IMAGO.—Expanse, 12–14 lines. Fore wing whitish ochreous, more or less suffused with a pale shade of raw sienna, and clouded with a darker shade of the same colour. The costa narrowly dotted with dark brown scales: beyond the middle these scales become more numerous, and form a distinct dark brown costal edging to the outer digit; this edging is interrupted just over the digital juncture by the whitish ochreous ground colour, which shows up in the costa at this point. Just below the digital juncture are some dark brown scales; in some examples these scales are so compacted as to form a distinct dot. Fringes, a paler shade of ground colour, with a patch of brownish scales at the angle of inner digit, and a smaller patch about the middle of the inner margin also brownish. Tip of outer digit, in some specimens produced and hooked, in others it is not produced and hardly pointed; tip of inner digit obtuse. Hind wing, first and second feathers brown, with a faint purple gloss; fringes paler. Shaft of third feather pale brown; fringe grayish brown, whitish ochreous at the base, with a small, apparently round, patch of dark brown scales in the middle of inner margin.* Head, thorax, and abdominal juncture whitish ochreous, more or less suffused with raw sienna. Hind legs whitish, with three brown bands; one large and one small one on the tibiæ, and a small one on the tarsi. The tarsal markings are only seen in fresh specimens. July.

---

* This patch also occurs in *dichrodactylus*, but reference to it was omitted in my description of that insect (Entom. xv. 140).—R. S.

As will be seen, on comparing the above description of the imago with that of *dichrodactylus* (Entom. xv. 146), there is no material difference between the two, except as regards the tone of colour.

In his differential note on *Platyptilia dichrodactylus* and *bertrami*, Mr. Sang says of *dichrodactylus* (E. M. M. xviii. 144):—"The imago fades—especially out of doors—sooner than any other I have any experience of; for I never took an example at large that was not more or less bleached: generally, they are almost white. . . . . My only captures of *bertrami* have been at Witherslack, where it seems pretty abundant. Now, I never took a faded one; they were all well coloured: so one would fancy that if they were identical, the food-plant must have caused a very complete alteration in the qualities of the colouring-matter of the scales."

I have not had the pleasure of taking the tansy-feeding insect; but as regards the yarrow-feeder, that is *bertrami*, I have been less fortunate than Mr. Sang, for a large proportion of the specimens I have met with were decidedly bleached, though not really worn. In the series now before me there are only seven well-coloured specimens; in the others the colour becomes fainter and fainter, until it finally vanishes almost entirely in the last two examples, which are nearly white, that is they possess but the least possible trace of their pristine coloration.

Mr. James Hinchcliffe, of Tillicoultry, was good enough to send me larvæ of this plume on the 24th of June last. One of these, during transit through the post, unfortunately managed to escape from the box; and on opening the parcel it was found flattened between an enclosed note and the top of the box. The others, three in number, were found separately in shoots of yarrow. Two of these appeared to be only half-grown when removed from their respective mines; but the third was nearly or quite full-grown. On comparing this larva with my description of the larva of *dichrodactylus*, as given in the 'Entomologist' (xv. 146), I was unable to find any important points of difference. Except that the prolegs and anal claspers of the yarrow-feeding larva were tipped with black instead of brown, the description of the tansy-feeder exactly applied. The position, appearance, and hirsute adornment of the tubercles were identical. In due course this larva pupated, and the pupa exactly agreed with my description of the pupa of *dichrodactylus*. On the 21st of July the moth made its appearance, and as it differs from all my captured examples I give a short description:—Expanse, 12 lines. So much suffused with an umber tint as to appear almost entirely of this colour; but the whitish ground colour shows itself along the inner margin, and again in a narrow ill-defined stripe from the costa to the digital juncture. The scales at digital juncture are hardly darker. All three feathers of the hind wings, including the fringes, are lustrous umber-brown, and there is no trace of darker scales along the inner margin of third feather. The tibiæ of hind legs are whitish to their middle, then brownish to the tarsi. The tarsi are whitish, and have three narrow brownish rings.

The apparently half-grown larvæ differed from the one specially examined in the coloration of the dorsal and subdorsal stripes. These stripes were of a colour rather difficult to express in words, but somewhat approached purple-brown. Neither of these larvæ, however, were destined to attain the perfect state. One of them eventually proved to be ichneumoned; and the other, from some obscure cause, failed to thrive, and died a few days after I received it.

Is Rössler's *bertrami* specifically distinct from the *dichrodactylus* of Mühlig? And if so, what are the differential characters? Compared with *bertrami*, *dichrodactylus* is said to present the following points of distinction:—

First.—"The palpi are decidedly longer" (Sang, E. M. M. xviii. 144). I have carefully examined the palpi of both insects, and quite fail to see that there is any perceptible difference in their respective lengths.

Secondly.—The tip of outer digit is rendered more acute by the deeper concavity of the hind margin of that digit (Id.). As has been adverted to in the description of *bertrami*, the tip of the outer digit is variable as regards its structure; in some specimens the hind margin of the outer digit is strongly emarginate, and the tip is in consequence produced and very acute.

Thirdly.—"The tibiæ are brown at the middle and apex, and there is a brown spot at the end of the first tarsal joint" (Stainton, E. M. M. ii. 138). Identical markings exist on the hind legs of fresh examples of *bertrami*.

Fourthly.—Larva feeds in "July, and the moth appears in

August" (Id.). Mr. Stainton says (E. M. M. ii. 137), "I have only a single bred specimen of *dichrodactylus*; this was bred from a *pupa* on tansy at Chudleigh, in June, 1850, and which appeared in the perfect state July 5th." The late Mr. Buckler bred this insect from June 28th to July 5th from larvæ received from Mr. Sang, June 8th (*cf.* E. M. M. xii. 233). The larvæ sent me by Mr. Sang in 1882 were feeding in June, and the moths emerged in July. Then as regards *bertrami* I have bred it, as stated above, in July, from June larvæ; and Mr. Porritt bred his *first* specimen on July 24th, from larvæ received June 25th (*cf.* E. M. M. xxii. 105). In a state of nature I have met with this insect from the end of June to the end of July.

From these facts it does not appear that *dichrodactylus* is a later insect than *bertrami*; but, on the contrary, they tend to prove that the two insects are synchronous.

In all reference to the tansy-feeding insect I have used Mühlig's name, *dichrodactylus*, to save confusion; but it should be remembered that the prior name is *ochrodactyla* of Hübner; and if it is ultimately conclusively proved that *bertrami* is not distinct, then Rössler's name also will be sunk, and the synonymy will stand thus:—

OCHRODACTYLA, Hübner.
dichrodactylus, Mühlig.
bertrami, Röessler.

Lord Walsingham, in his remarks on *P. bertrami* ('Pterophoridæ of California and Oregon,' p. 4), observes that the late Professor Zeller was inclined to consider *bertrami*, *ochrodactyla* (= *dichrodactylus*), and *bischoffii* as all belonging to the same species. The last named is a Texan insect, and I have not seen it; but as regards *bertrami* and *ochrodactylus* I quite concur in the opinion entertained by the late Professor.

12, Abbey Gardens, London, N.W., Oct. 14, 1885.

RHOPALOCERA IN THE NEW FOREST.

By F. W. Hawes.

On July 18th, in company with my brother, in pursuit of improved health and entomological specimens, I started for *ington*, which we found a convenient place for working the

New Forest and Isle of Wight. When I say that within six miles on either side of this town, we saw and could have captured thirty-three species of the Diurni during the three weeks from July 18th to August 8th, it will be seen that to a beginner the locality affords abundant opportunity for increasing his acquaintance with, and captures of, several of the much-wished-for species in the list. A detailed list of what may seem at first sight a large percentage of our Rhopalocera may not be uninteresting.

The three common species of the Pieridæ, viz., *Pieris brassicæ*, *P. rapi*, and *P. napi*, were of course plentiful in most parts of the neighbourhood; of the two former some specimens noticed were particularly large, while of the latter some were decidedly under the usual expanse of wing. *Gonepteryx rhamni* was common after July 25th in the Forest, more especially about Stubby Copse, but noticeably absent from the lanes; while among the Nymphalidæ no less than ten species were on the wing. Four of the genus *Argynnis* were visible; *A. paphia* was common in nearly all the enclosures, and in some really abundant, especially in Ramnor, Stubby Copse, and Park Hill. This insect was well out, although not worn, by July 20th; and on the 23rd my brother captured a confluent variety of the male at Park Hill, and at the same time and place a freshly emerged specimen of the variety *valezina in copulâ* with a typical male. Of this variety (*valezina*) we afterwards saw a dozen or more, nearly all about Stubby Copse; but although we took three they were much worn. Of *A. adippe* a few were seen and six captured in the more open parts of the enclosures, flying over and settling on common brake-fern; and of *A. aglaia* only two were seen,—one a fresh female in Ramnor Enclosure, and another in a lane between Sowley Pond and Beaulieu. Of *A. selene* two were seen as late as July 25th; of course much worn. Of the genus *Vanessa* five species were present. The larvæ and imagines of *V. urticæ* were seen in nearly all the lanes about Lymington; and one *V. polychloros* in Ramnor Enclosure on July 27th, and a pupa found under a gate-post in Lymington the same evening, from which the imago emerged four days later. Both larvæ and imagines of *V. io* were very common all over the district, forming a pleasant contrast to its apparent scarcity in the neighbourhood of London; also larvæ and imagines of *V. cardui*, especially in Stubby Copse; and in the lanes the larva of *V. atalanta* was also common. *Limenitis sibylla* was common; and in some enclosures, as Ramnor, Stubby Copse, and Park Hill, abundant. By 20th July the males were much worn, but the females were seen up to August 6th in good condition.

Apatura iris.—Of this fine insect we saw in all a dozen, mostly females. I was fortunate in capturing a pair in Stubby Copse, the male settling on bare ground a yard or two in front of us; the female flying low, enabling us to surprise and net it. Two others (females) flying low were unfortunately missed, tending to show, I think, that in large areas where *A. iris* is found its descents are more frequent than is generally supposed.

The Satyridæ were well represented; in all, eight species. *Melanargia galatea*, not seen in the Forest proper, but two or three on Lymington Heath, several in lanes between Sowley Pond and Beaulieu, single specimens here and there about Freshwater, and common between Yar Bridge and Cliffe Battery, near Yarmouth. Specimens of the second brood of *Pararge egeria* were common about Stubby Copse after July 31st; while that of *P. megæra* was just appearing on August 1st in lanes near Lymington. We found *Satyrus semele* scattered over the whole district, being common on Lymington Heath, where it had a curious habit of settling on fir trunks, apparently in the interests of self-protection; it occurred also on the heaths about Matley Bog, Hordle, and Beaulieu, and occasionally in the enclosures. Of *Epinephele ianira*, all that is necessary to say is that it was ubiquitous, except that we caught six of the bleached variety, five of which were males. The males would, therefore, appear to be more liable to variation than the females. *E. tithonus* was the most abundant species seen during our stay, some of the females being exceptionally large. In the lanes near the coast they were flitting in countless numbers over the brambles, but no varieties came under our notice; and *E. hyperanthus* was abundant in all the Forest enclosures, and common in many of the lanes. *Cœnonympha pamphilus* was common everywhere on waste ground.

Among the Lycænidæ we counted six species, among the most common being *Lycæna ægon* on the heaths, Matley, Lymington, near Hordle, and outside Ramnor Enclosure being the places in which we noticed it mostly. *Thecla quercus* was the only "hairstreak" noticed. In the enclosures it frequently came down to the brake-ferns with a swift zigzag flight. *Polyommatus phlæas* was seen here and there in lanes, and commonly on the cliffs at Freshwater. The second brood of *L. icarus* (*alexis*) was out commonly by August 6th in most waste places; and *L. corydon* in the lanes and on the downs near Freshwater, on July 30th. A few of the second brood of *L. argiolus* were seen near Beaulieu, flying over holly bushes; making in all a good family show.

Of the Hesperidæ the two common species were on the wing, a few *Hesperia sylvanus* being seen in the enclosures and in lanes; while *H. linea* was common on marsh-land near the coast, in the Forest, and in many lanes.

As we did nothing beyond day collecting, the number of night-flying species was limited. Besides many commoner ones, we saw *Calligenia miniata*, *Lithosia mesomella*, *L. lurideola* (*complanula*), *Euchelia jacobeæ*, *Psilura monacha*, *Bombyx quercus*, among the Bombycidæ; *Metrocampa margaritata*, *Ellopia prosapiaria* (*fasciaria*), *Pericallia syringaria*, *Boarmia repandata*, *Gnophos obscurata*, *Pseudoterpna pruinata* (*cytisaria*), *Selidosema ericetaria* (*plumaria*), *Eubolia limitata* (*mensuraria*), of the Geometræ; *Bryophila perla*, *Tryphæna fimbria*, *Phytometra viridaria* (*ænea*), of the Noctuæ; *Bombyx quercus* occurred in the Forest, and along the seashore near Hurst Castle; *P. pruinata* (*cytisaria*) common on all the heaths; while *B. perla* was to be found in some numbers on a red brick-wall just outside Lymington. Of *L. monacha*, a male pupa and a female imago were found on oak trunks in a fir wood on Lymington Heath. *S. ericetaria* (*plumaria*) occurred on heath, and we took five specimens (one a female). *T. fimbria* was occasionally seen on the wing in the enclosures; but of the others single specimens only were noticed. Larvæ we understood were backward; and, having our boxes well filled, the pleasure of larvæ-beating in the New Forest was deferred to another year. *Gortyna flavago* was common in thistle-stems on marsh-land near Lymington; and of the larva of *E. jacobeæ*, which was abundant, quite 90 per cent. were the victims of a *Microgaster*.

From this short sketch it will be seen that a good field of observation may be found, without actually staying in the Forest itself; and that collecting may be largely varied according to the disposition of the collector. Of the thirty-three Diurni, thirty excluding *L. sinapis*, *L. argiolus*, and *L. agestis*) were seen during the first fortnight of our stay, *viz*., from July 18th to August 1st; and on August 7th, in a lane about a mile long, leading from Sowley Pond to Beaulieu, we saw no less than twenty-four species in the course of twenty minutes, and every one of these was a regular inhabitant; indeed we came across no casual visitors, *C. edusa* and *C. hyale* being conspicuously absent. In the Forest we could but notice the absence of collectors. Although we frequented the more generally known parts for nine of the available eighteen days, we only met three; and from some wood-fellers we had the information that there was more to be taken at night than during the day. However, as our day work proved sufficiently interesting and remunerative, we neglected the sugar and the lamp; and, all things considered, have every reason to be satisfied with our first visit to this interesting and pretty locality.

Dovecote Villas, Wood Green, N., Aug. 20, 1885.

ERIOPELTIS FESTUCÆ, Fonsc., A SCALE INSECT NEW TO THE BRITISH FAUNA.

By G. C. Bignell, F.E.S.

For several years I have been familiar with the sight of little objects looking like tiny tufts of white cotton-wool adhering to a grass (*Festuca bromoides*) in certain localities, but I did not investigate their nature till lately. Having become interested in *Microgasterides*, and so learning to know their little woolly cocoons, I thought of these little tufts on the grass, and in my experiment to find out if they contained ichneumons I discovered their real nature, namely, that they are the females of the above-named scale insect.

Through the autumn the female becomes more and more thickly clothed with this woolly envelope, and I am sure her appearance would at first deceive the keenest entomologist, and make him think he had an *Apanteles* cocoon before him, from its size, shape, and colour, and the way in which it is fixed on the grass. On further examination, however, with a lens he would begin to be puzzled with the number of short curly ends projecting from the mass, unlike the spun thread of any cocoon.

The male is a little two-winged fly, without any covering, *but, curiously* enough, having two long filamentous tails.

The pupa-scales of both sexes may be obtained about the middle of July, almost close to the roots of the food-plant, and can only be found by pulling the grass up by the roots; the scales are very small.

In order to give dates and localities, I will mention that Mr. J. Scott and myself, on the road leading to Whitsand Bay, July 22nd, after being several times deceived by a seed (I believe, a grass-seed) adhering to the *Festuca* and looking much like a scale, found two pupa-scales, which produced a male and female, the former emerging in two days' time whilst on its passage through the post to Mr. Douglas.

Again, on August 3rd, at Bickleigh, not far from the railway-station, on the road to Shaughbridge, we found several females covered with the woolly clothing, but not to such an extent as those found later in the season; they were also lower down the stems; later they come up higher, and are very conspicuous.

On October 19th I again visited the Whitsand Bay locality, which is reached from Plymouth by passing through Wiggall Farm-yard, and found many females; these on examination, by removing a part of the cottony covering, proved to be mere masses of eggs. I may add I have always found them on the north side of the hedge or fence.

Stonehouse, Devon, October 20, 1885.

NOTES FROM CORNWALL.

By William S. Riding, B.A., M.D.

By a singular coincidence I again this autumn found a new locality in Cornwall for *Polia xanthomista*, var. *nigrocincta*. The Lizard district has many features in common with Morthoe, where I previously took this rarity (Entom. xvi. p. 248). It is an elevated plateau of extensive moorlands, covered with heather and scattered fields of cereals, some 200 to 300 feet above sea-level. A few clumps of trees, with here and there some others, mostly elms and poplars, isolated and weather-beaten, and a few wooded chines running down towards the sea, complete the landscape. The geological formation is igneous, chiefly serpentine and basalt, with clay-slate and talc-schists appearing in a few places. The coast scenery formed by these hard rocks, cut and

Mr. G. C. Bignell, of Stonehouse, was kind enough to send me larvæ of this species on June 17th this year. Some of them were nearly full grown, others quite small. He found them in a garden feeding on the small garden convolvulus (*Convolvulus minor*). When the supply of food sent with them was exhausted, shoots of the large convolvulus (*Convolvulus major*) were given them, which they took to readily, as also they did afterwards to the small bindweed (*Convolvulus arvensis* *). The larvæ pupated between June 26th and July 5th, and the moths appeared between the 6th and 30th of July.

I have frequently taken this "plume" in the autumn, and also in the spring. It may frequently be observed sitting on garden walls and palings. In this position its resemblance to a T-shaped bit of hay or straw is very curious. When at rest the hind pair of legs are laid along the body, the feet meeting at the end of the abdomen and resting thereon. The hind wings are folded up under the fore wings, and the inner digits of the fore wings are folded or rolled up under the outer digits, so that the fore wings are reduced to nearly half their width.

In the autumn of 1876 I observed *P. monodactylus* flying at dusk in some numbers around and about a clump of large bindweed (*Convolvulus sepium*). An examination of the plant next day resulted in the finding of several pupæ and larvæ.†

Until the present year, with the exception of hibernated specimens in the spring, I had not seen this species on the wing before the month of September. This year I netted one example at Folkestone on August 7th, and on the 29th I boxed two others from off a garden fence at Hampstead.

Hitherto *P. monodactylus* has been considered single-brooded, occurring in the larval stage in August and September, and in the perfect state in September and October, and again after hibernation in the spring. It appears, however, that there are two broods of the species in the year, although there does not seem to be any clear interval between the broods. Late imagines of the first brood may be contemporary with early imagines, certainly with larvæ, of the second brood. For this reason it would perhaps be more correct to say that there are a succession of broods between June and October. From my own observation I am inclined to think that there are but two broods, and that the periods may be approximately fixed as follows:—First brood, larva, June and July; imago, July and August. Second brood, larva, August and September; imago, September and October.

---

* In a recent note Mr. Bignell tells me that this plant also grew in the garden where he found the larvæ.

† This is not peculiar to *P. monodactylus*. Many of the Pterophoridæ are to be found as larva, pupa, and imago at one and the same time, and often on the same plant.—*R. S.*

Lord Walsingham, in his 'Pterophoridæ of California and Oregon,' writing of *Pterophorus monodactylus* (p. 40), says:—"One distinguishing peculiarity of this genus and species, whether in Europe or in America, by which it may always be immediately recognised, is the presence of brush-like tufts of appressed scales on the upper side of the hind feet. In good specimens these are noticeable on each of the tarsal joints below the second pair of spurs; . . . . . . it is remarkably constant, and does not occur, so far as I am aware, in any other genus of the Pterophoridæ."

PLATYPTILIA, Hb.

bertrami, Röessler.

IMAGO.—Expanse, 12–14 lines. Fore wing whitish ochreous, more or less suffused with a pale shade of raw sienna, and clouded with a darker shade of the same colour. The costa narrowly dotted with dark brown scales: beyond the middle these scales become more numerous, and form a distinct dark brown costal edging to the outer digit; this edging is interrupted just over the digital juncture by the whitish ochreous ground colour, which shows up in the costa at this point. Just below the digital juncture are some dark brown scales; in some examples these scales are so compacted as to form a distinct dot. Fringes, a paler shade of ground colour, with a patch of brownish scales at the angle of inner digit, and a smaller patch about the middle of the inner margin also brownish. Tip of outer digit, in some specimens produced and hooked, in others it is not produced and hardly pointed; tip of inner digit obtuse. Hind wing, first and second feathers brown, with a faint purple gloss; fringes paler. Shaft of third feather pale brown; fringe grayish brown, whitish ochreous at the base, with a small, apparently round, patch of dark brown scales in the middle of inner margin.* Head, thorax, and abdominal juncture whitish ochreous, more or less suffused with raw sienna. Hind legs whitish, with three brown bands; one large and one small one on the tibiæ, and a small one on the tarsi. The tarsal markings are only seen in fresh specimens. July.

---

* This patch also occurs in *dichrodactylus*, but reference to it was omitted in my description of that insect (Entom. xv. 140).—R. S.

As will be seen, in comparing the above description of the imago with that of *dichrodactylus* (Entom. xv. 146), there is no material difference between the two, except as regards the tone of colour.

In his differential note on *Platyptilia dichrodactylus* and *bertrami*, Mr. Sang says of *dichrodactylus* (E. M. M. xviii. 144):—"The imago fades—especially out of doors—sooner than any other I have any experience of, for I never took an example at large that was not more or less bleached; generally, they are almost white. . . . My only captures of *bertrami* have been at Whitesmocks, where it seems pretty abundant. Now, I never took a faded one; they were all well coloured: so one would fancy that if they were identical, the food-plant must have caused a very complete alteration in the qualities of the colouring-matter of the scales."

I have not had the pleasure of taking the tansy-feeding insect, but as regards the yarrow-feeder, that is *bertrami*, I have been less fortunate than Mr. Sang, for a large proportion of the specimens I have met with were decidedly bleached, though not really worn. In the series now before me there are only seven well-coloured specimens: in the others the colour becomes fainter and fainter, until it finally vanishes almost entirely in the last two examples, which are nearly white, that is they possess but the least possible trace of their pristine coloration.

Mr. James Hinchcliffe, of Tillicoultry, was good enough to send me larvæ of this plume on the 24th of June last. One of these, during transit through the post, unfortunately managed to escape from the box; and on opening the parcel it was found flattened between an enclosed note and the top of the box. The others, three in number, were found separately in shoots of yarrow. Two of these appeared to be only half-grown when removed from their respective mines; but the third was nearly or quite full-grown. On comparing this larva with my description of the larva of *dichrodactylus*, as given in the 'Entomologist' (xv. 146), I was unable to find any important points of difference. Except that the prolegs and anal claspers of the yarrow-feeding larva were tipped with black instead of brown, the description of the tansy-feeder exactly applied. The position, appearance, and hirsute adornment of the tubercles were identical. In due course this larva pupated, and the pupa exactly agreed with my description of the pupa of *dichrodactylus*. On the 21st of July the moth made its appearance, and as it differs from all my captured examples I give a short description:—Expanse, 12 lines. So much suffused with an umber tint as to appear almost entirely of this colour; but the whitish ground colour shows itself along the inner margin, and again in a narrow ill-defined stripe from the costa to the digital juncture. The scales at digital juncture are hardly darker. All three feathers of the hind wings, including the fringes, are lustrous umber-brown, and there is no trace of darker scales along the inner margin of third feather. The tibiæ of hind legs are whitish to their middle, then brownish to the tarsi. The tarsi are whitish, and have three narrow brownish rings.

The apparently half-grown larvæ differed from the one specially examined in the coloration of the dorsal and subdorsal stripes. These stripes were of a colour rather difficult to express in words, but somewhat approached purple-brown. Neither of these larvæ, however, were destined to attain the perfect state. One of them eventually proved to be ichneumoned; and the other, from some obscure cause, failed to thrive, and died a few days after I received it.

Is Rössler's *bertrami* specifically distinct from the *dichrodactylus* of Mühlig? And if so, what are the differential characters? Compared with *bertrami*, *dichrodactylus* is said to present the following points of distinction:—

First.—"The palpi are decidedly longer" (Sang, E. M. M. xviii. 144). I have carefully examined the palpi of both insects, and quite fail to see that there is any perceptible difference in their respective lengths.

Secondly.—The tip of outer digit is rendered more acute by the deeper concavity of the hind margin of that digit (Id.). As has been adverted to in the description of *bertrami*, the tip of the outer digit is variable as regards its structure; in some specimens the hind margin of the outer digit is strongly emarginate, and the tip is in consequence produced and very acute.

Thirdly.—"The tibiæ are brown at the middle and apex, and there is a brown spot at the end of the first tarsal joint" (Stainton, E. M. M. ii. 138). Identical markings exist on the hind legs of fresh examples of *bertrami*.

Fourthly.—Larva feeds in "July, and the moth appears in to be a specimen of *Anosia plexippus* (*Danais archippus*), in fine condition, and measuring four inches and a quarter in expanse of wing; and on the 24th we captured two others, both in the same fine condition and apparently freshly emerged, about a mile from the place where we had taken the first. These latter measured four inches and five-sixteenths and four inches respectively in expanse of wing. On the 29th I saw another specimen, which I was unable to capture, as it flew over the cliff. These insects were only seen by us on the very edge of the cliffs, especially where valleys with small streams led down to the sea; and in one of these valleys, with a large patch of ivy in full bloom on one of its slopes, we caught two specimens in one morning.—Alfred H. Jenkin; Trewirgie, Redruth, October 16, 1885.

[Mr. J. Jenner Weir will have some remarks to make in the next number of the 'Entomologist' upon the occurrence of this species.—Ed.]

Lycæna argiades, Pall., in Somerset. — A few months ago a gentleman living in this parish disposed of a small collection of Lepidoptera to me, having ceased for some time past to collect. The collection was fast going to ruin for want of attention, but I selected all those which were worth preserving, cleaned and "doctored" them, and placed the best and most uncommon specimens in my cabinet. Among these I noticed two small blue butterflies which somewhat resembled on the upper surface of the wings the male of *Lycæna icarus*, with the exception of "a small, slender, but quite distinct, black, white-fringed tail." I could not quite make them out, and the tail puzzled me. On seeing the woodcut of *L. argiades* in this month's 'Entomologist' I at once recognised a strong likeness between it and my two specimens. Comparing them together, and carefully examining the insects with Kirby's description, I found that they were undoubtedly *L. argiades*,—both male specimens,—and agreed in every detail with the description. On talking over this discovery with my friend, he told me he took them with several others, eleven years ago, not two miles from this house, close by a small quarry. Thus *L. argiades* would seem to be not quite new to the British fauna. From its similarity both in colour in size to *L. icarus* it would be impossible to distinguish them on the wing, or even while settled on a flower; and this may in some way account for its not having under notice before this. My authority for my specimens being British is my friend above mentioned, and in the interest of the Science I am ready to submit a specimen for identification.—(Rev.) J. S. St. John; Whatley Rectory, Frome, Oct. 16, 1885.

[No doubt others will be found in various collections; but nevertheless to Mr. Pickard-Cambridge belongs the honour of adding *Lycæna argiades* to the British fauna. Entomologists should keep a sharp look-out for this addition next year.—J. T. C.]

Note on Lycæna argiades.—Any information with regard to *Lycæna argiades* may be of interest at the present moment. During the last week of August, 1882, I met with this species on the coast, a few miles south of Biarritz, in a locality which may be described as a very sandy heath. It was flying in company with *L. icarus* and *L. bætica*, both of which species it much resembled on the wing. — A. H. Jones; Shrublands, Eltham, Kent, October 3, 1885.

Vanessa antiopa.—It may interest entomologists to know that a specimen of *V. antiopa* was seen on the cliffs at Charmouth, Dorset, on July 26th last.—A. Belt; Ealing, W., Oct. 24, 1885.

Abundance of Colias edusa and Vanessa cardui in North Kent.—Both these species have been plentiful this season, some hybernated *V. cardui* being out, as is their wont, till the new brood was appearing. *C. edusa* came out rather early; its abundance in 1885 is notable, as indicating that a dry summer does no harm to its caterpillar.—J. R. S. Clifford.

Colias edusa in North Devon.—On August 15th I saw one specimen of *Colias edusa* at Morte Bay; during a fortnight's stay in the neighbourhood I saw no other. A correspondent in Torrington, N. Devon, informs me that one male specimen was caught there this year. I may add that, while staying in North Devon in 1882, I saw none.—F. H. P. Coste; Tottenham.

Chœrocampa celerio at Retford.—I have again to record taking a specimen of *C. celerio*. It settled on a window-pane in a street near my garden, and was promptly brought to me.—S. Pegler; Retford, October 2, 1885.

Chœrocampa celerio at Ealing.—I have seen a fairly good specimen of *Chœrocampa celerio* captured here, at Ealing, on September 12th, by S. P. Deane, a young friend living at 36 Windsor Road, who caught it flying over Russian balsam about 8.30 p.m., upon which a street lamp was shining brightly. —J. Mortimer Adye; Ealing, London, W.

Chœrocampa celerio in Essex.—I am glad to be able to add another to the long list of captures of *C. celerio,* Mr. E. Bidwell having given me a specimen which had been caught by his nephew, Master H. H. Cotman, at No. 2, East Terrace, Walton-on-the-Naze, Essex, on September 15th. The insect when found was resting on the staircase, and was then quite perfect, but, having been kept in a box alive for four days, was somewhat injured.— J. R. Wellman; 8 Medora Road (late 219), Elm Park, Brixton Rise, S.W., October 12, 1885.

Chœrocampa celerio at Folkestone. — A specimen was caught in the town of Folkestone during the second week in September, and brought to Mr. Purday, who gave it to me. — J. A. Cooper; Sussex Villa, Leytonstone, October 20, 1885.

Chœrocampa celerio at Bournemouth. — I have just learned from Mr. Adye, who captured a beautiful specimen of *Chœrocampa celerio,* as recorded in this month's 'Entomologist' (xviii. 262), that another specimen of *C. celerio* has been taken a few days ago by the Rev. E. Brackenbury, of this town.— W. McRae; Bedford House, Bournemouth, October, 1885.

Chœrocampa celerio, &c., in Devonshire.—On September 16th I caught a female *C. celerio* at Lee, near Ilfracombe. It was flying at dusk, and visited stocks and fuchsias. I also found two *Sphinx convolvuli* at rest, on August 30th and September 6th respectively; I saw two or three others on the wing. They seem to have been common this year, as I have seen several taken by a friend at Buckfastleigh, besides one at Cambridge.—W. F. Blandford; 71, Grosvenor Street, W., September 25, 1885.

Chœrocampa celerio at Plymouth.—On the 19th ult. a friend brought me a fine specimen of this moth, which he caught in his drawing-room, at The Crescent, Plymouth, the previous evening.—J. P. Cregoe; Headland Park, Plymouth, Oct. 3, 1885.

Colias edusa, Acherontia atropos, Sphinx convolvuli, and Chœrocampa celerio.—Whilst staying at Lyme Regis in August, with my friend Mr. A. R. Wallace, we noticed that *Colias edusa* was fairly common, the butterfly confining its visits almost entirely to the yellow flowers of the fleabane (*Pulicaria dysenterica*), which grows so plentifully about the undercliff. *Acherontia atropos* appears also to have been unusually common this year in the larval state. In addition to the captures already recorded in the 'Entomologist,' I know of specimens having been taken at Oxford and Twickenham. *Sphinx convolvuli* appears to have been common throughout the South of England this year. Thus there have been reported to me the capture of three specimens at Hurstpierpoint, in Sussex; of two specimens at Portewood, near Southampton; and two at Godalming. On the evening of September 6th, whilst mothing in a garden at Sevenoaks, my cousin, Miss Constance Carvalho, and I each took a fine specimen hovering over the flowers of the "evening primrose" (*Œnothera biennis*). This observation is of interest, as Hermann Müller does not record *S. convolvuli* among the visitors to *Œnothera*. The moths captured by my cousin and myself had the proboscis well dusted with the yellow pollen of the flower. I noticed also that the male of this species possesses the scent-tufts on the ventral side of the base of the abdomen, to which attention has already been directed by Fritz Müller (Proc. Ent. Soc. Lond., 1878, p. ii). Another specimen has since been taken at Sevenoaks. I have just had reported also the capture of a specimen of *Chœrocampa celerio* at the beginning of the month, at Hurstpierpoint.—R. Meldola; September 26, 1885.

Acherontia atropos and Macroglossa stellatarum at Sea.—On August 26th, while homeward bound from Australia and when entering the chops of the Channel, two very fine specimens of *A. atropos* were captured on board the ship; and on the 11th of the same month, while we were at anchor off Algiers, a damaged specimen was brought to me by one of the blue-jackets. A few nights afterwards, between Algiers and Gibraltar, while we were smoking on deck, an *atropos* alighted at the feet of one of the officers and ran squeaking up his leg, much to his astonishment; but it flew away before it could be captured. *M. stellatarum* was to be seen every day between Malta and Gibraltar; and on August 25th, two days before we reached Plymouth, one was observed flying about the ship.—Gervase F. Mathew; Instow, N. Devon, October 8, 1885.

Sphinx convolvuli at Bury.—On September 13th a specimen of this species was found at rest on a tombstone in the cemetery. —R. Kay; 3, Ingham Street, Bury St. Edmunds.

Abundance of Sphinx convolvuli at Bournemouth. — Lepidopterists in this part of the country will probably long remember the autumn of 1885 as the "*Convolvuli* year." The specimens of this species which have been seen and captured in this locality far exceed in number those of any season for at least twenty years. The long dry summer seems to have been peculiarly favourable to the development of the larger Sphingidæ generally. From an early date in August till about the middle of September *Sphinx convolvuli* was taken plentifully, both at rest in the daytime and on the wing at night, in all parts of the town. During this time I alone netted over three dozen fine specimens hovering over flowers both in my own and in our public gardens; and altogether I venture to say that not less than a hundred have been taken in various ways in this neighbourhood. Sugared bouquets of flowers, consisting chiefly of honeysuckle, geraniums (pale), and petunias, I found to be a most attractive bait; and I would strongly recommend the adoption of this plan to collectors who cannot get access to any large beds of flowers. In fact, judging from my own experience, had I been able to procure honeysuckle in sufficient quantity, I certainly should have confined myself mainly to this kind of bait. I noticed that white and pale-coloured flowers were far more attractive than those of deeper hues. I attribute this simply to the fact that the former are more conspicuous at night than the latter. Has anyone ever detected any sound proceed from the rapid vibration of the wings of this moth during its hovering flight? I listened most carefully, but in no instance did my ear detect the slightest whirr or sound of any kind. My opinion is that its flight is perfectly noiseless. I am sorry to add that I failed to obtain any eggs, although I kept five likely females alive for some time for this purpose. We have instances on record of eggs being obtained in the autumn (Entom. vi. 545, xviii. 259); but as no subsequent mention of the larvæ from the former eggs is made, we may be justified in assuming that they were not fertilized. I believe it is asserted by some entomological authorities that *Sphinx convolvuli* do not pair until after hybernation, and my experience favours this conclusion. I have, however, a strong suspicion that in this country very few, if any, of the moths survive the winter. Is it not more probable that part of the pupæ remain through the winter, emerging the following May or June, and that copulation takes place between the sexes of these only? Dr. Boisduval, in his elaborate description of six distinct and well-marked varieties of the larvæ of this species, states that they feed upon various species of *Convolvulus*, but particularly upon *C. arvensis;* and to obtain this caterpillar it should be looked for, in July, in fields where *C. arvensis* grows among crops of potatoes or beans. From its size, and excrements lying round the plants, he says it is easily detected. In this country, up to the present time, no one, so far as I know, has seriously attempted to verify this statement. The larvæ must have been, this season at least, quite as numerous as the moths; and I cannot help believing that a judicious and systematic examination of *Convolvulus arvensis* and *C. sepium*, wherever found, by even a few experienced collectors, must have resulted in the discovery of numbers of larvæ. — W. McRae; Bedford House, Bournemouth, October, 1885.

Sphinx convolvuli in Sussex. — This fine moth has occurred here twice this season, two specimens in good condition having been taken by a friend of mine. The first was taken on August 17th, settled on some palings; and the second, near the same place, about September 12th. It seems to have been found very plentifully in most places this year.—W. H. Blaber; Beckworth, Lindfield, Sussex, October 8, 1885.

Callimorpha hera in Devon.—In the 'Entomologist' for 1884 (vol. xvii., p. 233) I gave an account of the occurrence and capture of *Callimorpha hera.* Early in August, 1885, I journeyed to the pretty little seaside village of Starcross, at the mouth of the Exe, about two miles and a half from Dawlish, which place I have annually visited for the last six years. I commenced work on the 10th with a very dull prospect, for nothing could be disturbed by beating. On the 12th Mr. Waring and I had gone up a narrow lane to return with but little for our labour, when my son, a lad of twelve years of age, strolling later into the lane, to his surprise saw one of the insects of our search on the wing, which he succeeded in capturing. On the 16th, while returning from the Warren, an enclosure from the sea, which in places is covered with heath, thrift, galium, and rushes, where we had been taking the pretty little *Mesotype virgata* (*lineolata*), which was in some abundance, we took to the woods, through a large orchard, into a narrow lane, where we commenced to beat, and very soon dislodged our second specimen of *C. hera*, which was a female in fair condition. A gentleman from London, staying at Dawlish, has succeeded in taking two others, one being a variety. *Lycæna icarus* was in extraordinary abundance; and *Epinephele tithonus* was equally common. *Colias edusa* was seen or taken on most days; and *Thecla quercus* was in plenty in a forest on Holden Hill, where we took about four dozen in less than an hour. On the cliffs at Dawlish we succeeded in taking two dozen each of *Acidalia marginepunctata* (*promutata*); I counted five within the space of a foot sitting with their wings extended on the red sandstone. Of Noctuæ there was a general scarcity, but few of the common species being met with; and sugaring proved quite a failure.—W. Brooks; The Lodge, The Oaks, Lower Norwood, S.E., September 12, 1885.

Deiopeia pulchella in Hampshire.—On October 6th, 1876, my pupils and I were fortunate enough to take two fine specimens of *D. pulchella* on the moorland between Bournemouth and Christchurch, now known as Southborn-on-Sea; and on the same date, in the same locality, there is a record of the capture of five specimens by the Rev. E. Brackenbury, of this town (Bournemouth), and his pupils (Entom. ix. 258). Since that time I have been in the habit of visiting the locality annually two or three times with the hope of finding more of this rarity, but each time failed to turn the species up again. The operations of the "brick and mortar" speculation in this neighbourhood have been so extensive and continuous of late years that my hopes (at one time well grounded) of the permanent establishment of *D. pulchella* in the locality were with each succeeding year becoming fainter and fainter. I have, however, a strange fascination for the spot where a rarity has once been captured, and, led by this, I again visited the old ground on October 7th and spent a couple of hours, with my usual success, nil. When about to return home, however, my little dog dashed past me in pursuit of a rabbit, and, rushing in among some ferns, started a pale-looking insect, which I instantly netted, and found to be *D. pulchella*. While engaged in bottling my prize some children came up, and to satisfy their curiosity I showed them my capture, when one of them said, "Harry has a butterfly like that"; and sure enough, to my surprise, in an old mustard-tin the little fellow actually had a living specimen of *D. pulchella*, with sundry still more lively grasshoppers, &c., all boxed off the moor within the previous hour. They had no net or other apparatus, and, as far as I could learn, they found the *D. pulchella* at rest on the ferns. I at once struck a bargain for the "butterfly," leaving them in possession of the grasshoppers, which seemed equally appreciated by them. On examination I was glad to find the insect had sustained little damage from either the handling of its juvenile captors or from its ill-assorted fellow-prisoners.—W. McRae; Bedford House, Bournemouth, October, 1885.

Plusia interrogationis at light.—At the end of August this year I took a worn specimen of *Plusia interrogationis* at light in Cambridge. As this species is, I believe, generally only found on moors, it may be worth recording.—A. Robinson; Brettanby Manor, Darlington, October 8, 1885.

Aporophyla nigra in Dorsetshire. — On October 6th my brother, Mr. C. A. Marriott, took a fine specimen of *A. nigra* at Hamworthy. It was flying round a lamp in a room. — F. F. Marriott; 11, George Lane, Lewisham, Kent.

Phibalapteryx polygrammata [not] in Essex.—This species was obtained at Felsted, by one of the members of the Natural Science Society at Felsted Grammar School, in the course of last year; and afterwards bred, as far as the pupa, from eggs obtained by him. There is a short description of the larva in the report of the Society for 1884.—Francis C. Woodbridge; Lewes, Sussex.

[The notice of this species, in the recently issued 'Third Annual Report of the Felsted School Natural Science Society,' at once attracted my attention, and I also saw that an old error had again misled others. It is time it was corrected. Knowing that in Newman's 'British Moths' the figures and descriptions of *Phibalapteryx vittata* (*lignata*) and *P. polygrammata* (*conjunctaria*) were transposed, I at once communicated with Mr. J. M. Bacon, of Swallowfield Vicarage, Reading, through the Rev. A. W. Rowe, and received the following reply:—"I am afraid that your supposition is correct; the moth of which I obtained the larva is the one which is represented in fig. 343, p. 175, of Newman's 'Moths,' and named *P. conjunctaria*. As I have had but small experience, and have had no one to refer to in any case of doubt, I have had to fall back upon my book, and hence the error." This very excusable error is not without its results, and does not greatly mar the entomological report of a school society, in which it is pleasing to read that "It was very gratifying to see so much more energy displayed during last year than had been shown in previous years; and, now that the movement has been so well started, there is every reason to hope that it will continue to the benefit of those who are fond of the study of Entomology and of the Society in general." The life-history of *P. vittata* (*lignata*) is given by the Rev. J. Hellins, in Ent. Mo. Mag., viii., 18; and by Hoffmann, in Stett. ent. Zeit., xliii., 101.—E. A. F.]

Asthena blomeri.—In reply to Mr. St. John (Entom. xviii. 263), Pflümer took this species in Hanover as early as May 12th (Stett. ent. Zeit., xl., 159); and Hellins had eggs laid in July and August (Ent. Mo. Mag., xi., 87).—Edward A. Fitch; Maldon.

Notes on Lepidoptera of the Year.—On August 3rd and 10th I captured at Andover several fresh specimens of *Colias edusa*, all males. On August 18th I found larvæ of *Notodonta trepida* and *N. trimacula* (*dodonea*) in Savernake Forest.—(Rev.) C. A. Sladen; Burghclere, Newbury, October, 1885.

Notes from my Diary: Lepidoptera.—The insect mentioned (Entom. xviii. 246) as *Notodonta bicolor* should be *Sehirus bicolor*, Linn., one of the Heteroptera. I found two specimens of this pretty species at Orpington amongst ivy, &c., while collecting shells. [This error was corrected on the wrapper of the number in which it occurred.—Ed.] I continue my notes up to the present date. August 13th.—Saw a male *Gonopteryx rhamni*, at Chislehurst, visit first a flower of *Centaurea nigra* and then one of *Carduus arvensis*. Has anyone noticed that *G. rhamni* seems particularly fond of pink flowers? On September 18th one of these butterflies spent fully a quarter of an hour over pink pelargonium; but, nevertheless, it seemed fully conscious of its conspicuousness on the pink blossoms, for when purposely alarmed, it at once flew to some green foliage, where it was scarcely visible. August 18th.—Found a specimen of *Triphæna ianthina*. This species has been unusually abundant at Chislehurst this year. On September 8th I received a specimen from Cabourg-sur-mer, North France.—T. D. A. Cockerell.

Lepidoptera at Southport.—In the middle of August last I found *Agrotis tritici*, *A. aquilina*, and *A. obelisca* occurring together on the sand-hills at Southport; the other species of the genus with them being *A. vestigialis* (*valligera*), *A. cursoria*, and *A. præcox*. In the daytime *Phytometra viridaria* (*ænea*) was common, but very much worn; the specimens were larger, and the few good ones seen were brighter in colour than I have ever noticed in the various inland localities I have seen the species. *Leucoma salicis* was common at the lamps, and had evidently occurred in the greatest profusion, for the cocoons containing the empty pupæ were to be seen spun up "in bunches" at the ends of the willow shoots; whilst many larvæ had crawled off the bushes and spun up in the dock and other large leaves near, often a number on a single plant.—GEO. T. PORRITT; Huddersfield, October 3, 1885.

AUTUMN SUGARING AT CHRISTCHURCH.—Autumnal sugaring has been good here this year; in one evening I have seen nearly a hundred moths on a small patch. It would be quite unnecessary to mention all I have taken, but the following is a list of the most important:—*Xylina socia* (*petrificata*), *X. semibrunnea* (three), *Agrotis saucia* (numerous), *Calocampa exoleta*, *Aporophyla lutulenta*, *A. nigra*, *Xanthia flavago* (*silago*), and *X. fulvago* (*cerago*). —J. M. ADYE.

XANTHIA FERRUGINEA FEEDING ON ASH. — On May 3rd, in walking along the road at Box Hill, I passed under a very large ash-tree, the decaying flowers of which had fallen off in quantities. On examining one of these I found a small Noctua larva therein. I collected sufficient to fill a small tin, and on reaching home threw the contents into a jam-pot, with a few of the unexpanded buds of the ash. On examining it at the end of a week I found four larvæ, which grew rapidly, and when full fed were put into a small pan filled with earth. Early in September the four moths emerged, much larger, darker, and richer in colour than those in my cabinet. As I believe the seed of the wych elm is given as the food of this species, I thought it would interest the readers of the 'Entomologist' to know it is also to be obtained from ash.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., October 17, 1885.

SOUND-PRODUCING LARVÆ.—Can the larva of *Acherontia atropos* produce a sound? As this insect has been common in the larval state this summer, evidenced by reports already published, it is to be hoped some observations on the above vexed question may be forthcoming. Fuessli is said to have been the first entomologist who noticed it, and that accurate observer, Newman, confirms what he had stated. Though Kirby and several other authors refer to the circumstance, it seems to be doubtful whether they had themselves had proof. By some entomologists doubt has been thrown upon the statement. A larva I had recently in my possession was obstinately silent, but died before it was adult. Perhaps the larva loses the power in captivity, just as that of *Dicranura vinula*, when imprisoned, appears no longer to employ its peculiar squirt.—J. R. S. Clifford; Gravesend, Oct. 3, 1885.

Sirex juvencus at South Norwood. — A friend of mine captured a fine female specimen of *Sirex juvencus* on the 20th of last September; he found it buzzing about in a fender in his house at South Norwood. Not knowing what it was, he boxed it and handed it to me a fortnight after, when it was still alive and quite perfect; so I liberated it in my studio, and it flew about with a swift, steady flight, making a very loud buzzing hum; the deep metallic blue body and gold bronze wings gave it a handsome appearance when flying. As I did not know what *Sirex* it was, I sent a coloured drawing to Mr. Carrington, who kindly named it for me. — F. W. Frohawk; Park Place, Eltham, Kent, October, 1885.

Sirex juvencus at Bognor.—A fine female of this sawfly has been brought to me, having been captured in the vicarage on September 27th. Is this really a British insect, or may it have been imported in the timber used in building the vicarage, which was newly erected three or four years ago? I can find but very few records of its occurrence in this country, and none of its appearance in this immediate locality.—A. Lloyd; The Dome, Bognor, October 14, 1885.

Sirex juvencus.—Which is the commoner of the two *Sirices* —*S. gigas* or *S. juvencus?* Judging from my own experience I should say that *S. juvencus* is rather a rare species, for whilst both here and in Hampshire several specimens of *S. gigas* have from time to time fallen into my hands, I have never till this present season had the pleasure of seeing *S. juvencus* alive; but on *September* 23rd my friend Dr. Arthur E. Buckell, of this town, captured a fine female, which he sent to me. She deposited in the box a number of eggs.—JOSEPH ANDERSON, jun.; Chichester.

[Both species of *Sirex* appear to have been unusually common this present season, for quite a number of *S. gigas* and several *S. juvencus* have been sent for identification to the office of the 'Field' newspaper.—J. T. C.]

THE MIGRATION OF APHIDES.—In relation to migration of Aphides, referred to by Mr. Clifford (Entom. xvi. 290), I may say that it occurred in Huntingdonshire. A friend and I were tricycling from St. Ives to Fen Stanton, and during the ride we became covered with Aphides. They got into our eyes, and were very annoying. My friend, who did not know their habits, was surprised to see their numbers. In some parts of the journey they were in clouds; in fact they became so excessively troublesome that we turned back without accomplishing our journey. The afternoon was oppressively hot, the wind being due south. This migration lasted for three days, according to my observation, from July 26th to 29th. I conclude if the weather is pretty uniform in temperature all over the country the Aphides migrate about the same time; but no doubt other correspondents will give their experience.—HERBERT E. NORRIS; St. Ives, Hunts, Oct. 3, 1885.

TELENOMUS PHALÆNARUM, *Nees*.—I have again bred this small egg-parasite; this time from *Pygæra bucephala*, and one only from each egg; these were all females. Those from *Bombyx trifolii* (Entom. xviii. 247) contained both sexes.—G. C. BIGNELL; Stonehouse, Plymouth, Sept. 9.

"TRESPASSERS WILL BE PROSECUTED." — Such is the notice that meets one on every hand in the New Forest now. Whether Mr. Lascelles, the present Ranger of the Forest, has the legal right or no, he is having boards to this effect nailed on trees at the entrances to many of the enclosures. This is a matter which I think all entomologists will agree with me in considering of the greatest importance, and one that should have some explanation. —P. BRIGHT; Roccabruna, Bournemouth, October, 1885.

OCNERIA DISPAR: CORRECTION.—In my account (Entom. xviii. 263) of the occurrence of *Ocneria dispar* in Warwickshire, the sentence beginning, "They were at the time of feeding," &c.; for "feeding" read "finding."—W. H. BLABER.

REVIEW.

Handbook of European Butterflies. By W. F. De Vismes Kane, M.A., M.R.I.A. Fifteen plates and 184 pages, 8vo. London: Macmillan & Co. 1885.

This small volume forms a very welcome adjunct to Dr. Lang's 'Butterflies of Europe.' The latter book is too valuable and bulky to be used as a *vade mecum* by the entomologist when travelling on the Continent; but Mr. Kane's book exactly fulfils the necessary conditions.

There are 15 plates, containing 134 figures, done by a photographic process; partly, it would appear, by the Typo-Etching Company, and partly by the employment of the isochromatic plates prepared by Messrs. Attout Tailfer and John Clayton, of Paris. Of course this mode of illustration reproduces the irregularities of the setting, and all the defects of the specimen figured; but, on the other hand, there can be no dispute as to the faithfulness of the representations. Some of the plates are excellent, notably plates vii., xi., xiii., and xiv. The genera *Argynnis* and *Melitæa* appear to have presented considerable difficulties in the delineation of the upper sides; but even in these instances the under sides figured in plate x. are very characteristic.

The introduction is pleasant reading; and Mr. Kane gives clear directions as to the apparatus necessary for taking and bringing home a collection of butterflies in a small compass. He recommends placing them in the usual triangular envelope, of which a figure is given. There is another plan, which he does not mention, *viz.*, placing them in pill-boxes, with a disk of paper between each flat specimen.

The letterpress of the body of the work is well written; and the key to the different genera will prove of great assistance to the beginner.

The "List of European Rhopalocera, with their principal Synonyms," has been prepared with great care; and it is much to be hoped that it will be issued separately, printed on one side of the paper, to serve the purpose of labels.

Mr. Kane may be congratulated in having supplied a distinct want.

THE ENTOMOLOGIST.

Vol. XVIII.] DECEMBER, 1885. [No. 271.

ANOSIA PLEXIPPUS, Linn.

By J. Jenner Weir, F.L.S., F.Z.S., F.E S.

In the 'Entomologist' for 1876 (vol. ix., pp. 267, 268) I gave a short account of this insect under the name by which it was then generally known, viz., *Danais archippus*, Fabr. A figure of the larva was also given attached to the Rev. T. E. Crallan's communication, recording the capture of the insect at Lindfield, Sussex, near Hayward's Heath (Entom. ix. 265). Mr. McLachlan has been good enough to furnish me with an unrecorded instance of the capture of this butterfly near Poole, Dorsetshire. The date of capture is not quite certain, but was probably 1876, the year in which others were taken in England and South Wales.

This year nine specimens of the insect have been seen on the wing in the counties respectively of Dorset (Ent. Mo. Mag., xxii., 134), one specimen captured; in Devonshire, one was captured at Plymouth, and formed the subject of a communication read at the meeting of the Entomological Society in October last; six, of which four were taken, occurred in Cornwall (Entom. xviii. 290, 291); and Mr. Lester Arnold, Bedford Park, Chiswick, writes to me that a fresh and strongly-marked specimen was seen by him on the Ventnor Parade, Isle of Wight, early in September last. It was not caught, but he has no doubt of the identity of the insect, having had opportunities of seeing allied Danaine butterflies in their native countries, and being familiar with our British species. The insect flew low down within a foot or two of

Mr. Arnold, and he distinctly saw the markings; and states that amongst the flowering myrtles and geranium bushes of the warmest part of England it did not look out of place. This is the ninth specimen of *A. plexippus* recorded as having been seen in England this year. No doubt numbers have been seen, and their appearance has not been recorded.

I have been in correspondence with Messrs. Anderson and Jenkin, and in each case, of the four Cornish specimens, there seems no reason to doubt but that they were actually bred in this country. It is, therefore, probable that some impregnated females crossed the Atlantic, and deposited their eggs on a plant capable of affording food to the larva.

Anosia plexippus, according to Professor Riley, in the 'Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri' (1871, pp. 143–152), is in that State double-brooded. The hybernating female appears in May, lays eggs, and the first butterflies emerge about the middle of June; these lay eggs again, and the second brood appears on the wing in October. Probably in the region of Hudson's Bay, from which I have received the insect, it is but single-brooded. The inclement climate of the latter district does not affect the size of the imago indeed I have one from Moose rather larger than a specimen Mr. P. Crowley gave me from Fiji, both males.

Two of the plants on which the larva feeds, viz., *Asclepias tuberosa* and *A. purpurascens*, are hardy in this country; and it would be very desirable to ascertain whether either of these plants are grown in any of the gardens near the spot where the specimens under consideration were captured.

Professor Riley, in the same report, states that the imagines often appear in immense swarms, millions filling the air to the height of three or four hundred feet. If but a few of these descended and hybernated on board an ocean steamer trading to this country, they might even cross the Atlantic several times before they awoke from their winter's sleep.

The chrysalids are suspended in a similar manner to those of the well-known species of *Vanessa* and *Pyrameis*, and, like them, the chrysalis state lasts but a short time. The emergence takes place in about ten days from the period of transformation of the larva.

There appears to me to be a fair chance that *Anosia plexippus* will establish itself in this country. I had a letter from the late Mr. Charles Darwin, in which he wrote that he shared my enthusiasm on the subject.

Chirbury, Beckenham, November, 1885.

DIURNI OF THE UPPER ENGADINE.

By William E. Nicholson.

During the summers of 1884 and 1885 I had the pleasure of spending the month of July and a few days of June in the Upper Engadine, in company with my father, when we diligently collected the butterflies of the neighbourhood. A list of what we captured may be acceptable to some of the readers of the 'Entomologist,' now that more interest is shown in continental Entomology.

We made St. Moritz our head-quarters for the greater portion of our first visit, and Pontresina for the whole of our second visit. Pontresina is by far the best centre for entomological excursions, as it is also for mountain excursions, as from thence most of the best localities can be easily worked; notably the Bevers Valley, the Roseg and Morteratsch Valleys, and the Heuthal. The only good localities easier to work from St. Moritz were Alp Laret and the Fex Valley. The month to choose for collecting in the Engadine is July, as very few species occur in June, and at the end of July all the fields have been mown, and most species are getting worn. I am indebted to the kindness of Dr. Lang for the names of several of the species mentioned in the following list:—

Papilio machaon, rather common near St. Moritz in 1884, but scarce in 1885.

Parnassius apollo, abundant near St. Moritz, but not so common near Pontresina. *P. delius*, common in the neighbourhood of Pontresina, especially in the Roseg Valley; it was also abundant in the Fex Valley.

Aporia cratægi, abundant early in July, but soon over.

Pieris brassicæ, *P. rapæ*, and *P. napi*, common nearly everywhere, but not abundant. *P. napi* was the commonest; and the aberration, *bryoniæ*, was not rare, but difficult to obtain in good condition. *P. callidice*, common in several places, especially near the Bernina Hospice, but very swift on the wing.

Euchloe cardamines, twice noticed near the summit of the Maloja Pass.

Leucophasia sinapis, common in the woods round St. Moritz.

Colias palæno, common near the Morteratsch Glacier; the aberration, *werdandi*, was also rather common near the Bernina Falls. *C. phicomone*, very abundant everywhere. *C. edusa*, worn specimens were not uncommon near St. Moritz in 1884, but fresh specimens were rare; probably commoner later on in the season. *C. hyale*, one specimen was captured near St. Moritz, and another noticed near Pontresina.

Gonepteryx rhamni, twice noticed near St. Moritz in 1884.

Thecla rubi, one specimen was noticed near Pontresina.

Polyommatus virgaureæ: this beautiful species was very abundant, sunning itself with expanded wings or flitting from flower to flower; the females also were very common on the flowers of a certain small species of *Senecio*, and rather darker than the usual type. *P. hippothoe* var. *eurybia*, not quite so common as the preceding, but widely dispersed. *P. dorilis* var. *subalpina*, not very common; occurred chiefly in a wood at the foot of the Schafberg.

The genus *Lycæna* was represented by no less than sixteen species, most of which were common, and liable to great variation in the markings of the under side of their wings. *L. argus*, abundant everywhere, except at a great elevation. *L. optilete*, rather common in a wood opposite Pontresina, and in the Roseg and Morteratsch Valleys; usually in peaty places. *L. pheretes*, common near the Languard Fall at the end of June and beginning of July. *L. orbitulus*, common on the Muottas Murail and other places at a great elevation. *L. astrarche* (*agestis*), common in several localities, and very dark. *L. eros*, occurred in many places singly, but was rather common in the Bevers and Fex Valleys; the females, however, were scarce everywhere. *L. icarus* (*alexis*), common everywhere; some of the specimens were very fine. *L. eumedon*, common at the foot of the Schafberg. *L. bellargus* (*adonis*) and *L. corydon*, common almost everywhere; the *corydon* were not so strongly marked as our English ones. *L. damon*, common near St. Moritz, on a bank covered with *sainfoin*. *L. donzelii*, common in the openings in larch woods, at the foot of Schafberg, and in the Roseg Valley. *L. minima* (*alsus*), common in weedy places. *L. semiargus* (*acis*), occurred in similar places. *L. alcon*, a few specimens were captured near the Morteratsch Glacier. *L. arion*, a very dark form occurred, but was not very common, chiefly near the Languard Fall.

Vanessa urticæ and *V. cardui*, abundant everywhere; I noticed them both on the Morteratsch Glacier, far from any sign of vegetation. *V. atalanta*, once noticed near St. Moritz. *V. antiopa*, one large specimen was caught near Pontresina.

Melitæa cynthia, rather common in the Murail Valley, where I found the larva. *M. maturna*, not common; occurred several times in the Roseg Valley. *M. aurinia* (*artemis*) var. *merope*, abundant in marshy places at a great elevation, especially on Alp Laret, near St. Moritz. *M. phœbe*, rather common near the Languard Fall; some of the specimens are very dark. *M. didyma*, abundant on the Schafberg; the var. *alpina* also occurred. *M. dictynna*, common at the foot of the Shafberg. *M. athalia*, common and very variable, both as regards size and intensity of markings. *M. aurelia* var. *britomartis*, not very common; occurred chiefly in the Heuthal. *M. parthenie* and var. *varia*, abundant in many localities, usually at a fair elevation.

Argynnis selene, not common; occurred near St. Moritz. *A. euphrosyne*, common in the woods round Pontresina. *A. pales*, very abundant; the vars. *napæa* and *arsilache* were also common; my father took a perfectly melanic specimen last year crawling along a ditch near Sils Maria; it is uniform black above, with a purplish tint, somewhat resembling that of *Thecla quercus*, and the markings on the under side of the hind wings are arranged in stripes. *A. amathusia*, rather common in the Bevers Valley. *A. thore*, one specimen was caught in a wood near the Pontresina Gorge. *A. ino*, rather common in the Bevers Valley. *A. latona*, common near St. Moritz, flying over a large bed of bugloss. *A. aglaia*, very abundant; often three of them would dispute the possession of a single thistle-flower. A gentleman, staying at our hotel, presented me with a beautiful melanic specimen, that he had caught in his hat in a meadow close to the village; it is rather larger than most specimens of *aglaia*, and somewhat resembles the var. *pelopia* of *A. niobe*, but is rather darker, and all the silver spots on the under side, with the exception of a few at the base of the wings, are blotted out with black. *A. niobe* and var. *eris*, abundant everywhere; my father caught a specimen of the var. *pelopia* near St. Moritz in 1884.

Erebia epiphron var. *cassiope*, a few very dark specimens were captured in the Roseg Valley. *E. melampus*, abundant in every meadow. *E. mnæstra*, common on the Schafberg, just above the tree limit. *E. evias*, common near St. Moritz in 1884. *E. glacialis*, common on the summit of the Schafberg, but difficult to catch on account of its frequenting dangerous precipices. *E. lappona*, common on the Muottas Murail. *E. tyndarus*, abundant in many places, at a lower elevation than *E. lappona*. *E. gorge* and var. *triopes*, common near the Bernina Hospice and in the Heuthal. *E. goante*, abundant near the Languard Fall towards the end of July. *E. euryale*, very abundant; the females vary very much in their markings, some being very like *E. ligea*, and others more like *E. æthiops*.

I found no species of *Satyrus* or *Epinephele* in the Upper Engadine; and in looking at a type collection, made by the landlord of the Hotel Saratz, I noticed that he had not any also, although he had specimens of *Pararge mœra*, that he said he had caught there, but he had taken them a long time ago, and did not seem to know much about the species. It is plentiful in many of the lower passes on the way to the Engadine, from Chur or the Italian Lakes. *E. ianira* was very common at Bellagio, and occurred some way up the Maloja Pass, but not at such an elevation as Pontresina by a thousand feet or more.

The only species of *Satyrus* that I noticed this year were *S. semele* and *S. dryas*, both common near Thusis, about 4000 feet lower than the Engadine. The Upper Engadine Valley lies at an elevation of 5550 feet at Pontresina to 6000 feet at St. Moritz; and I see that Dr. Lang says that *Epinephele ianira* does not inhabit the higher alpine regions. The common species of Satyridæ seemed to be replaced by the various species of *Erebia*. No doubt several species occur in the Lower Engadine; but we did not explore the Engadine lower than Bevers.

Cœnonympha satyrion, abundant everywhere. *C. pamphilus*, not so common as *C. satyrion*; occurred in the Roseg Valley.

Syrichthus serratulæ, common near the Lake of St. Moritz, and several other places. *S. cacaliæ*, abundant often at a great ation, especially in the Roseg valley.

Thanaos tages, not very common; occurred several times close to the village of Pontresina.

Hesperia lineola, a few specimens were caught in the Bevers Valley. *H. comma*, abundant in the Roseg Valley, and many other places.

Lewes, October 22, 1885.

A YEAR'S WORK AMONG THE GALL-GNATS (1885).

By Peter Inchbald, F.L.S., F.E.S.

I have succeeded in reading a portion of the life-history of some few gall-gnats during 1885. Some species I have reared only sparingly, others abundantly.

The first gall-gnat to appear under the bell-glass was *Cecidomyia acrophylla* (Winnertz), which emerged from its cocoon on the 13th of May, and the gnats continued each morning to put in an appearance till nearly the close of the month. The larva of this gall-gnat affects the leaves of the common ash, causing sausage-like swellings to appear on the under side of the midrib of the upper leaflets. Each gall appears longitudinally on the rib, and contains from three to four tenants. When the larva is full-fed, which is in September, or early in October, the gall splits open on the upper surface of the leaf, and the tenant drops to the ground, and burrows into the soil. I reared the imagines in fair abundance, both male and female, from last year's affected leaves. Kaltenbach raised the gnat in 1874, in May and the early part of June.

C. cratægi (Winnertz) was my next hatch. It first appeared on the 2nd of June, and the gnats continued to appear till the end of the month. The metamorphosis is chiefly external, although occasionally, as Kaltenbach remarks, internal. The larva is instrumental in forming those terminal leaf-rosettes we notice on the shoots of quickset hedges. These contain several larvæ. The leaves of the rosette are curiously contorted and thickened, and thus made to furnish food and shelter to the reddish-coloured larva, which feeds within the leafy tuft. I bred the gnats, as I said, in considerable quantities, during the whole of the month of June. The bosses I gathered in July of 1884, when the larvæ were nearly full-fed. Occasional sprinklings of water, so as to assimilate Nature, are quite essential for rearing these tiny gall-gnats.

The Cecid of the nettle-gall was the next to appear in the glass-topped box (*C. urticæ*, Perris). It put on wings on the 13th of June, and continued to do so for ten days or a fortnight, each morning giving me some three or four. The larva affects the leaf-stalk and ribs of the common nettle, the galls not unfrequently assuming a rosy tint. When fully grown the gall opens, and the larva falls to the ground, pupating in the soil, and spinning for itself a white and silken little web that is readily noticed. The larva of the nettle-gall, I may remark, differs in colour from the ordinary Cecid-larvæ. It is whitish during the whole stage of its larval existence. I bred several imagines, both male and female. Like other Cecids, it is very active in its winged state.

During the closing days of June and the first half of July I bred, in some abundance, from the woolly flower-heads of the milfoil or sneezewort (*Achillæa ptarmica*), the *Hormomyia ptarmicæ* (Vallot), the *H. floricola* of Winnertz, and others. I last bred it, by reference to my note-book, in 1861, in August. The affected flower-heads are readily noticed; for, as Winnertz remarks, "the whole flower-head is changed into a hairy crown." The pupæ of the gall-gnat occupy the central pseudo-florets, whence they emerge in the early morning hours, leaving their silvery shroud behind them in a vertical position. Sometimes, indeed, half the crown is tenanted, sometimes only three or four of the pseudo-florets. You will need to be an early riser to see the transformation scene. I bred fairly abundantly both *H. ptarmica* and *H. millefolii* in 1860 and 1861. The one affects the flower-head, the other the axils of the root-leaves, of the respective plants. An urn-shaped gall in the latter case is the result, which contains a single larva that pupates within the gall. The two gall-gnats are, indeed, as distinct in their economy, as in their specific characters. Winnertz, always a most accurate observer, was perfectly aware of their distinctness as species.

The last Cecid I bred this year is *C. persicariæ* (Linnæus). A single specimen emerged from its pupa-case on September 3rd. The others I shall not look for till June next. The larvæ feed exposed, in company, and by their united efforts succeed in rolling up and thickening both the borders of the lanceolate leaves of the knot-grass (*Polygonum amphibium*), which change to a cherry-red colour. In the curled leaf they feed, and when full-fed they pupate, forming a slender oat-shaped cocoon of silk, that is intensely white. I have quite a bevy of cocoons, so that I hope to rear both sexes by due care and attention. Winnertz only reared the female, he tells us. I found the larva and pupa some few times in the same fold of the leaf, thus evincing diversity in feeding. Kaltenbach states that the larva lives in July on *P. amphibium*. This I invariably found to be the case, though *P. amphibium* and *P. persicaria* frequently grew side by side.

Fulwith Grange, near Harrogate, Nov. 10, 1885.

NEW FOREST: "TRESPASSERS WILL BE PROSECUTED."

By Herbert Goss, F.L.S.

In the November number of the 'Entomologist' (xviii. 303), Mr. P. Bright, of Bournemouth, states that Mr. Lascelles, the Deputy Surveyor of the Forest (or "Ranger," as Mr. Bright styles him), is having boards, intimating that "Trespassers will be prosecuted," nailed on the trees at the entrances to many of the enclosures; and he raises a question as to Mr. Lascelles' "legal rights" in so doing, and suggests that the matter is one that requires explanation.

In assisting, in 1875, the New Forest Defence Association in opposing the Bill, then before Parliament, for the enclosure and destruction of the whole Forest, it became my duty to make myself acquainted with the history of the New Forest, and the Acts of Parliament relating to its management and government; and I may, therefore, be competent to furnish some information on the question now raised by Mr. Bright.

The total area within the boundaries of the New Forest comprises some 92,365 acres, of which 27,140 acres are private property, 125 acres are copyhold of Her Majesty's Manor of Lyndhurst, 600 acres are leasehold under the Crown, 500 acres are enclosures belonging to Lodges, and 1000 acres are private woods and plantations of the Crown; thus leaving 63,000 acres for the "woods and wastes" of the Forest.

The whole of these "woods and wastes" were, prior to 1698, open and unenclosed; but under the authority of the Acts 9 & 10 William III.* c. 36 (1698), and 48 George III. c. 72 (1808), the Crown was empowered to enclose, and keep enclosed, freed and discharged from all rights of Common, and from all manner of rights, titles, or pretences, or privileges, or claims whatsoever, such quantity of land in the Forest as would amount to 6000 acres, for the growth of timber.

By the Act of 14 & 15 Vict. c. 76 (the Deer Removal Act of 1851) the Crown was authorised to enclose and plant with trees any quantity of land, not exceeding 10,000 acres, in addition to the 6000 acres already in enclosure under the authority of the Acts before mentioned; and the 4th section provided that "The said enclosures so made and set out as aforesaid, shall remain in severalty, in the actual possession of the Crown, freed and discharged of and from all rights of Common, and of and from all manner of rights, titles, or pretences, or privileges, or claims whatsoever, during the period of the same remaining so enclosed, for the growth and preservation of timber and trees."

The powers conferred by these Acts are not repealed by 40 & 41 Vict. c. 121 (the "New Forest Act, 1877"); but the rights of enclosure are by Sec. 5 of the last-cited Act limited to "Such lands as are at the date of the passing of this Act enclosed, or as have, previously to such date, been enclosed by virtue of commissions issued in pursuance of the said Acts or some of them"; and by Sec. 7 of the Act the right to enclose is made subject to any "right of the Public to use any Public Highway which may traverse the said lands."

Assuming that the enclosures referred to by Mr. Bright have been made under the authority, and subject to the provisions, of the Acts of Parliament before quoted, and that they are not traversed by any "Public Highway," there cannot, I think, be any doubt that the Commissioners of Woods and Forests, on behalf of the Crown, and their local representative the Deputy Surveyor, have the power to exclude the public from such enclosures, and to warn them of the consequences of their *trespassing* therein.

---

* *This Act was passed in 1691, but did not come into operation until 1698.*—H. G.

Entomologists, botanists, and other persons desiring to enter the enclosures in question, should apply for permission to do so at the office of the Deputy Surveyor, Queen's House, Lyndhurst. Of course it is in the power of the Deputy Surveyor or his assistants to refuse such permission when applied for; but in my twenty-three years' experience of the New Forest, and of the conduct in this respect of the officials at the Queen's House, I am not aware of any instance of such a refusal.

Surbiton Hill, Surrey, November 12, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA POLYCHLOROS IN LONDON.—Early in the afternoon of the 7th inst., whilst passing along the south side of Smithfield Meat Market, I observed a large brown butterfly flying slowly about in the sunshine; presently it settled on the wall of the building, and to my surprise I saw it was a very fair specimen of *Vanessa polychloros*.—W. G. SHELDON; The Oval, Addiscombe, Croydon, October 18, 1885.

REAPPEARANCE OF VANESSA IO IN NORTH KENT.—I have already referred in these pages (Entom. xviii. 51) to the paucity or total absence of this bold *Vanessa* in many localities where it had at one time been abundant; as for instance about the chalk-pits and slopes of Kent. This year I have seen it between Gravesend and Dartford upon ground where I have sought vainly for it since 1879 or 1880.—J. R. S. CLIFFORD; Gravesend, Oct. 3.

COLIAS EDUSA AND C. HYALE.—A single specimen of *Colias hyale* was captured, settled on a flower in a garden at Warley, early in September; and *Colias edusa* was seen about the same date in that neighbourhood. *C. edusa* also occurred near Lyndhurst, in the New Forest, about the middle of August; and I myself in company with a friend took half a dozen specimens in half an hour near Yarmouth (I. W.). My brother, Rev. P. E. Raynor, who was staying at Budleigh Salterton, reported it as abundant there; and on my sending him twelve glass-topped boxes, promptly returned them to me with twelve live *C. edusa*. He also tells me he saw a specimen on the wing at Hazeleigh, in Essex. On the whole this seems to have been a very fair year for *C. edusa;* but I do not hear of *C. hyale* being taken elsewhere, except at Warley; but perhaps some of your correspondents may have seen it.—(Rev.) Gilbert H. Raynor; Shenfield, Brentwood, November 9, 1885.

Colias edusa in Sussex.—I took a very fine female specimen of this butterfly in a garden at Groombridge, on September 8rd; and on the 15th of the same month saw four specimens on the banks of a disused railway near the same village, some of which I captured. On the 18th I saw three more in the same locality. I also saw a remarkably large specimen in a rough field on the 23rd, but unfortunately had no net with me at the time. A friend of mine tells me he found this butterfly plentifully in a clover field at Frant, near Tunbridge Wells, about the end of August.—W. H. Blaber; Beckworth, Lindfield, Sussex, Nov. 13, 1885.

Lycæna corydon on Barnes Common.—My son captured a male specimen in good condition of *L. corydon* on Barnes Common, near London, about the end of August last.—H. Sharp; 37, Union Street, Portland Place, W., Oct. 17, 1885.

Diminutive Diurni.—Whilst in Dorsetshire, during the month of August, I noticed many more small forms than usual of *Epinephele tithonus* and *Lycæna icarus;* and also many amongst *Pieris brassicæ, napi,* and *rapæ.* The small specimens, however, of *L. icarus* were very frequent of both sexes,—the males being darker in colour than the full-sized examples,—and often not larger than *L. minima* (*alsus*). *Colias edusa,* of which I saw many specimens from the sea-coast to as far as twenty miles inland, were not large specimens. Would the long period of dry weather have any effect in checking the full development of the imago?—T. B. Jefferys; Clevedon, October 24, 1885.

Sphinx convolvuli and Chœrocampa celerio in Sussex.—I have taken this year *Sphinx convolvuli,* September 11th and a beautiful specimen of *Chœrocampa celerio* hovering over phlox, at Firle, September 23rd.—Dover C. Edgell; Firle, Lewes, October, 1885.

Sphinx convolvuli at Beckenham.—A fine specimen of *Sphinx convolvuli* was captured at Beckenham, on September 8th this year, by my sister, who gave it to me alive. I also captured a female specimen of *Colias edusa,* near the same place, three *ys later.*—G. Bailey; 6, Queen Adelaide Road, Penge, S.E.

Acherontia atropos at Burton-on-Trent.—On September 28th last I had a fine specimen of *Acherontia atropos* brought to me by a railway man, who found it on a truck at Branstone Junction, near this town. A few days before I had a pupa of the same species from a man who had been at work in a potato field. I have also heard of several larvæ being taken in and about the town this year.—J. E. Nowers; Burton-on-Trent, Oct. 13, 1885.

Zygæna filipendulæ var. ochsenheimeri.—While looking over the collections at the late sale at Mr. Stevens's, I saw in one of the drawers of European Lepidoptera the variety of *Zygæna filipendulæ* named *ochsenheimeri*. I have taken it in the metropolitan district for several years, but never could find a name for it before. The difference in the variety is that the spot near the centre of the costa and the one nearest the tip are much smaller than in the type; also the green nervure cuts through the spot nearest the tip; and, what is more striking, it has a broader border on the under wing. The time of appearance is much earlier than that of *Z. filipendulæ*, as I generally take it in May. I have distributed a great many of them to several well-known entomologists, and do not suppose it is at all rare, but think it ought to be recorded. I have now placed the name to the series in my collection.—C. J. Boden; 228, Bermondsey St., London.

Zygæna filipendulæ impaled. — While collecting on the sand-dunes in Morte Bay I found a *Zygæna filipendulæ* impaled on a long spike of grass; it was speared through the abdomen from side to side, and very little damaged. I have the specimen, grass and all, in my cabinet.—F. H. Perry Coste; Tottenham, Sept. 17, 1885.

Callimorpha hera in South Devon.—Whilst staying at Dawlish last year, Mr. Brooks, whom I met by accident, informed me of his having taken several *Callimorpha hera* (Entom. xvii. 233). He showed me the exact locality; and this year I hunted the ground, in company with a friend from London, for that species, when, on August 24th, I was fortunate enough to capture a female specimen, the ground colour of the hind wings being yellow, like those of *Arctia villica*. In beating the high hedges of the neighbourhood I disturbed another *C. hera*, which, however, escaped.—J. Jager; 180, Kensington Park Road, Notting Hill, W., November, 1885.

Catocala fraxini in Hyde Park.—I had the good fortune to capture a fine specimen of *Catocala fraxini* in Hyde Park on September 9th last. It was at rest on a tall sycamore near the Serpentine, thirty feet from the ground, and not being sure whether it was *C. nupta* or not I threw a handful of gravel at it. It fell at my feet, feigning death. A gardener had seen it two hours previously on an ash tree, but not knowing its value took no notice of it. I have no doubt it had emerged from the pupa in the immediate locality; it had apparently not flown far.—Joseph Potter; 24, Henrietta Street, Brunswick Square, London, November, 1885.

Lepidoptera of Derbyshire. — The lepidopterous fauna of the midland counties of England does not appear to have so much engaged the attention of entomologists as that of some other districts, and generally the impression prevails that they are somewhat barren of species and not profitable working ground for the collector. Some short notes of a sojourn therein, from 8th to to 18th June last, may not be without interest. A considerable proportion of my time was not available for Entomology, and the weather generally was not favourable; but, in spite of these obstacles, I managed to take a number of, and some fairly good, species. I made the village of Little Eaton (three miles north of Derby) my head-quarters; the country round here looks very promising, the subsoil is chiefly gravel, and the district is noted for its quarries of freestone. The flora is very extensive, and many plants well known and valued by entomologists occur freely; this is particularly the case with respect to the food-plants of the *Eupitheciæ*, no less than twenty-six species of which genus occur within a radius of two miles. In front of my lodgings stretched Breadsall Moor, an elevated tract of country covered with heath, bilberry, &c.; whilst all round were fine woods of larch, fir, oak, &c., intermixed with beech, birch, alder, and a large growth of sallow. I did not sugar, and chiefly confined my operations to day-work. Amongst the species I took were *Drepana falcataria*, *Eupithecia nanata*, and *Tephrosia punctularia* amongst birch. *Asthenia luteata*, *E. obliterata* (*heparata*), and *Hypsipetes trifasciata* (*impluviata*) were common amongst alder; whilst in the neighbourhood of larch and fir *E. indigata* and *E. lariciata*, with *Macaria liturata*; fine forms of *Tephrosia biundularia*, dark as *Boarmia gemmaria* (*rhomboidaria*), occurred freely, and *Coccyx tædella* (*hyrci-

nana) swarmed. On black poplar were to be found young larvæ of *Tæniocampa populeti*, and in one wood *Abraxas sylvata* (*ulmata*) were in profusion. On Breadsall Moor *Eupithecia nanata*, *E. minutata*, and *Anarta myrtilli* were common, and also *Phoxopteryx myrtillana*; whilst every sprig of bilberry was tenanted by a larva of *Grapholitha geminana*, and *Phycis fusca* (*carbonariella*) also occurred. Of general distribution were *Hadena glauca*, *Thyatira batis*, *Emmelesia albulata*, *Eupithecia pulchellata*, *E. pumilata*, &c. The larvæ of *Tethea subtusa* abounded on poplar all round the neighbourhood. I paid two visits to Repton; there *Lobophora halterata* (*hexapterata*), *Melanthia albicillata*, *Coremia designata* (*propugnata*), and *Phoxopteryx lactana* (*ramana*) were seen on the tree-trunks, the larvæ of *Cheimatobia boreata* were common on birch, and those of *Thecla w-album* on wych elm. The day previous to my return was spent at Lathkill Dale, a mountain-valley situated near Bakewell, and celebrated for its picturesque scenery. Seeing a wych elm here, I opened my umbrella and beat; down came quite a shower of larvæ of *Xanthia gilvago* and *X. cicellaris* (*ferruginea*); a little farther on *Nisoniades tages* was common. I stopped to examine a sallow bush; it was only a small one, and could have been covered with an ordinary-sized blanket, yet off it I took over 150 larvæ of *Cleoceris viminalis*; these when bred produced some fine varieties, of all shades of colour from quite black to the ordinary light southern form. Up the sides of the valley the males of *Nemeophila plantaginis* were flying freely in the sun, and in company with them swarms of *Ino geryon*. I can confidently recommend this and other mountain valleys of the district to resident collectors; they have scarcely been worked, and, judging from the flora, many rarities must occur, especially amongst the smaller Lepidoptera. At any rate a day at Lathkill Dale is well spent, if only for the sake of its scenery, adorned by the mountain stream, clear as crystal, swarming with trout and grayling.—W. G. SHELDON; The Oval, Addiscombe, Croydon, October 14, 1885.

NOTES ON THE SEASON: EASTBOURNE; NEW FOREST; MALVERN.—In June and July last I made several trips to the neighbourhood of Eastbourne, Sussex, and met with fair success, as the following report will show. Among the Diurni I took, mostly in good condition, *Argynnis paphia*, *A. euphrosyne*, *A. selene*, *Melitæa athalia*, Melanargia galathea, *Pararge megæra*, *P. egeria*, *Epinephele hyperanthus*, *E. tithonus*, and a freshly-emerged variety of *E. ianira*, in which the usual colouring of the male is replaced by a beautiful fawn-colour, but in other respects does not in any way differ from the typical male. *Thecla quercus* was in profusion round the oaks, but very difficult to obtain, owing to their unwillingness to descend within reach of the net. *T. rubi*, earlier in the season, was plentiful. I saw a fine specimen of *Limenitis sibylla*, which I believe is rare in this locality. By beating the underwood I procured *Angerona prunaria*, *Metrocampa margaritaria*, *Boarmia consortaria*, *Melanippe hastata*, and other common species. *Nemeophila plantaginis* was frequent in the clearings, as also was *Lithosia mesomella*, which I have not observed there before. Hybernated *Gonepteryx rhamni* and several of the Nymphalidæ (Vanessidæ) were commoner than usual. At the beginning of July I passed a week at Brockenhurst, where I anticipated, after the previous warm weather, that many of the forest species would be well out, but it was quite the reverse; for although the mornings were still bright and warm, yet one might stroll through many of the rides without seeing anything of more importance than a worn *Pararge egeria*. I was much surprised when I heard from Gulliver that neither *Argynnis paphia* nor *Limenitis sibylla* had been seen. However, after four days without any success as regards day-work, *A. paphia* turned up, but not in any abundance; *L. sibylla* also, but sparingly. Giving up the enclosures in disgust, my attention was turned to the heaths, where I disturbed *Lithosia mesomella*, *Euchelia iacobeæ*, *Nemeophila russula*, *Acidalia straminata*, *Aspilates strigillaria*, *Eubolia plumbaria* (*palumbaria*), and *Eupithecia nanata*. Neither *Selidosoma ericetaria* (*plumaria*), nor *Gnophos obscuraria* were discovered, although I worked hard for them. *Acidalia emutaria* occurred among other species in the bogs. The night-work as regards sugar was a total failure, but on several nights Geometers appeared in some numbers on the wing. I netted, among others, *Metrocampa margaritaria*, *Bapta temerata* (commonly), *Cleora lichenaria*, *Boarmia repandata*, *Melanthia albicillata*, with *Calligenia miniata* and *Cymatophora duplaris*. *Gnophria quadra* was again entirely absent; and only one larva of *Psilura monacha* discovered. I paid another visit to Stubby just before leaving, but, with the exception of *Epinephele* *hyperanthes*, which was now emerging, no fresh species were met with. Larvæ beating, I may mention, was extremely unprofitable. The country in the Malvern district (Worcestershire) during the latter end of August was still more disappointing. The only species of Diurni seen were *Rhodocera rhamni* (one example), *Vanessa cardui* (one specimen), *Pararge megæra*, *Epinephele tithonus*, *Cœnonympha pamphilus*, and *Hesperia thaumas* (*linea*). I noticed a large number of Noctuæ on the wing at dusk, but they were of the very commonest species. One fact I think is particuularly notable, and that is that I have not seen a single specimen of *Vanessa urticæ* this season, either hybernated or otherwise. With regard to this neighbourhood I consider it a fair average year. I received, with several other good species, a very fine specimen of *Sphinx convolvuli* at the beginning of the present month; but, as far as my experience goes, the season of 1885 (up to date) has been a very little improvement, if any, upon the last two years. I hope to hear more encouraging reports from other localities.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., September 23, 1885.

LEPIDOPTERA IN S. IRELAND.—The past season has been, on the whole, very good in the South of Ireland, although some specimens were rather late. Numbers of hybernated *Vanessa io* and *V. urticæ* appeared about April 18th, and on that day I first observed *Euchloe cardamines*. *Pararge egeria* did not appear till May 3rd. The common *Hepialus* was first seen by me in the long grass of the fields on June 5th. On June 14th, in the same wood in which I saw one last year, I caught three *Melitæa aurinia*. This wood is quite dry, and I have ceased to believe moisture to be a requisite for this species. The common *Ino statices* was swarming at this time in the same place, looking like green flies when on the wing. On June 16th I went to the same place, but, although the day was very fine, I could not discover a single *M. aurinia*. I was, however, rewarded by a splendid *Macroglossa bombyliformis*. I missed it at first, but managed to catch it a quarter of an hour afterwards. *Venilia macularia* was now seen in great profusion, and *Hepialus humuli* was a perfect pest. *Zygæna filipendulæ* was also very common, and at night I caught *Plusia gamma*, *Acronycta psi*, *A. euphorbiæ* (*myricæ*) and *A. rumicis*, *Hadena oleracea*, *Mamestra brassicæ* and *M. persicariæ*, *Abrastola urticæ*, and *Rumia cratægata*; while among the Bombyces were *Hepialus velleda* and

H. lupulinus, *Diloba cæruleocephala*, *Dicranura vinula*, *Arctia caia*, *Spilosoma menthrasti*, *S. lubricipeda*, and many other common moths. Sugar was quite a failure. The best plan for taking Noctuæ was to catch them with a net and lantern. I was over in England from July 10th till August 12th, but when I returned the country was swarming with *Colias edusa*. We always noticed that they were to be met with in most plenty at the sea-side. Although the Vanessidæ were as numerous as ever, I have not seen *Macroglossa stellatarum* once this year, though they were plentiful last season. By the above list it will be seen that what there are in Ireland are abundant, but the number of species appears to be very limited.—Harry C. Sandford; Bellevue Park, Military Road, Cork, September, 1885.

Melanism in Renfrewshire.—Having received remarkably black forms of *Thera variata* from my friend Mr. Watson, of Renfrewshire, I determined to visit his locality this year, and started on the 13th September. This journey was not unaccompanied by adventure, for on account of their being two stations of the same name, but on different lines, out of Glasgow, my wife and I found ourselves late at night in a most lonely locality, and utterly lost. At length, through the kindly hospitality of a Mr. Young, who most good-naturedly helped us out of our difficulty, we reached our destination. I found, with Mr. Watson, some most lovely forms of black *T. variata*, also *T. firmata* and worn *Retinea turionana;* some very black. Among the Lepidoptera Mr. Watson had saved for me were some most extraordinary varieties of *Cidaria immanata:* part of these were of the Arran, while others were like the Shetland, types. I never saw a more mixed series. *Hypsipetes trifasciata* (*impluviata*) are most variable, and in a novel radiating manner: some are so black as to be steel-blue in ground colour, with a chain-like row of white spots on the margin; others have the same ground colour, with a band of bright brown in the anterior wings. The May brood of this species are much larger than those of September in that locality. *Melanippe montanata* occurred, some of which were of the Shetland form; while *Melanthia bicolorata* (*rubiginata*) are of the Rannoch type. There is an *Eupithecia* in the wood, but the specimens are so black that one cannot make out the species. The *Oporabia dilutata* of the district are also very dark. I observed *no undergrowth* in the wood, though outside there was heath.

My friend Mr. Watson tells me that this locality, which is about ten miles from Paisley, is the only remaining bit of "virgin soil" in the Clyde Valley. Certainly the aptitude to melanism among Lepidoptera is remarkable; and a series of such *T. variata* as we took is well worth all the journey and trouble to see.—J. B. HODGKINSON; Fishergate, Preston, Sept., 1885.

RETARDED APPEARANCE OF LEPIDOPTERA.—With reference to Rev. J. S. St. John's note on *Asthena blomeri* (Entom. xviii. 263), during the past season certain species have been very erratic in the time of their appearance. Thus *Thera variata*, which I observed early in June in Derbyshire, has been common at West Wickham up to September 26th, when it was abundant and in fair condition. *Argynnis aglaia* was just coming out near Dover on August 1st (quite a month late). Autumnal larvæ in this part of Surrey are very backward; I have *Eupithecia pimpinellata* still quite small; these I usually take full-fed about September 10th.—W. G. SHELDON; The Oval, Addiscombe, Croydon, Oct. 14, 1885.

RETARDED APPEARANCES OF LEPIDOPTERA.—On June 23rd, 1879, I found, at Burghclere, a nest of larvæ of *Eriogaster lanestris*, which made their first appearance from pupæ in successive years, as follows:—1880, none; March 6th, 1881; January 1st, 1882; March 3rd, 1883; April 2nd, 1884. On April 18th, 1882, I obtained some ova of *Endromis versicolor* at Andover, the imagines of which (many larvæ having died about full-fed) made their first appearance on April 1st, 1883; March 22nd, 1884. In July, 1882, I found a larva of *Dicranura vinula*, which remained in pupa till May 20th, 1884.—(Rev.) C. A. SLADEN; Burghclere, Newbury, October, 1885.

ECCENTRIC APPEARANCES OF LEPIDOPTERA.—On August 3rd, 1883, I caught *Pterostoma palpina* at light; August 11th, 1885, I caught *Hepialus lupulinus* at light; September 8th, 1885, I bred *Dianthœcia capsincola* from larvæ of the year, the only one of several dozen that thus emerged.—(Rev.) C. A. SLADEN.

ERRATIC APPEARANCE OF LEPIDOPTERA.—I have now, October 17th, a larva of *Plusia iota* just turning to pupa; larvæ of *Vanessa atalanta*, varying in length from three-fourths of an inch to full-fed, and four just turned to pupæ; *Eugonia quercinaria* (*angularia*) now emerging, though some were bred two months ago. A female *Amphydasis betularia* deposited a brood of ova only three weeks ago, so if the larvæ do not make haste they must either hybernate or starve. These pupæ of *V. atalanta* must either die or remain so over the winter, which suggests that many of the very fine Vanessidæ found in spring may have passed the winter in pupa state, and not hybernated as imagines.—H. Sharp; 37, Union Street, Portland Place, London, October 17, 1885.

Perforated Ova of Lepidoptera.—I discovered last year that the eggs of *Dicranura vinula* are perforated at the apex by a small orifice, which apparently penetrates through the outside shell, but is covered on the interior of the shell by a thin membrane, resembling that which is found in the eggs of domestic fowls, &c. Though I mentioned the fact at the time to several entomologists, no one seems to have noticed it; so I carefully noted the discovery, and determined to publish it on the first opportunity. I should be much obliged if any entomologist would let me know whether the eggs of *D. bifida* and *D. furcula* are similarly perforated.—Cyril B. Holman Hunt; Draycott Lodge, Fulham, S.W., November 9, 1885.

Urtication by Larvæ of Bombyx rubi.—I have just seen a case of urtication caused by larvæ of *Bombyx rubi*, a number of which have been brought to me by a friend from Devonshire. His hands are covered with small white blisters, and he suffers from inflammatory swelling upon them. This is the first case I have noticed of this species causing this irritation. The effect seems to vary with different individuals, for some seem very sensitive to the urticating power of the hairs, though I have never experienced it, and, so far as I can judge, it has no effect upon me.—H. Sharp; 37, Union Street, Portland Place, London, W., October 17, 1885.

Sound-producing Larvæ. — In reply to Mr. Clifford's question, "Can the larva of *Acherontia atropos* produce a sound"? (Entom. xviii. 301), I can most confidently assert—for I have heard them myself—that the larva, pupa, and imago of this moth have *all* the power of doing so. The noise made by the larva is a kind of snap, exactly resembling the *electric spark*. In the case of the pupa and moth it is nearly identical, though in the pupa somewhat fainter, and is a shrill, grating squeak, not unlike that of the dolls which, upon being squeezed, give forth a cry. How this sound is made is still a moot point. I cannot for a moment entertain the idea that the squeaking appears to be connected in some way or other with a small membranous capsule, which is situated on either side of the body at the base of the abdomen, and which is covered with some hairs, which can be made to vibrate. I am convinced that the squeaking of the moth is connected with the proboscis, for when holding them in my fingers by the base of the wings, prior to chloroforming them, and they have been squeaking loudly, expressing apparently their disapproval of the retention, the instant I pressed the tongue the sound ceased. I have to-day (November 5th) been experimenting with an uncommonly noisy specimen recently emerged, and am certain that *it is by the proboscis that the squeaking is produced.* This may be confirmed also by holding the moth to the ear whilst it is emitting its cries, when it will be at once detected that it is from the mouth that they proceed. But though the tongue may likewise be the organ of the sound emanating from the pupa, I am at a loss to understand the way in which it is made by the larva.—JOSEPH ANDERSON, jun.; Chichester, November, 1885.

RELATION BETWEEN BRITISH AND JAPANESE INSECTS.—At a recent meeting of the Asiatic Society of Japan (reported in the 'Japan Mail'), a paper, by Mr. H. Pryer, was read on the relation between the Lepidoptera of Great Britain and Japan. From the statistics given it appears that about 16 per cent. of the British species are found in Japan. At first sight there does not seem to be any strong resemblance between the Japanese and British specimens of certain species; but the differences are demonstrably due simply to the effect of temperature. In Japan the temperature forms are very numerous, because of the fluctuations in temperature which are so peculiar to the country. When the great distance separating the countries, and the striking climatic differences are considered, the identity of such a large percentage of species is a fact of the highest interest to the entomologist.

ECONOMY OF GEOTRUPES STERCORARIUS.—I observed that only a few straggling specimens of this beetle were to be seen this summer, until the break-up of the drought in August, when the insects appeared numerously. It may be assumed, therefore, that most of them were earth-bound, and unable to work up to the surface till the soil was loosened by rain. No beetle, I believe, is so frequently to be found along roads and pathways at early morning, not because it has chosen such places for its perambulations, but having fallen there during the night it has been vainly trying to mount again in the air, which is matter of difficulty, even when it has mounted a twig. This beetle, though rapid in flight, is yet singularly awkward, hence soon thrown to the ground by any obstacle, and on *terrâ firmâ* its movements by day are very slow; possibly, in some cases, this arises from exhaustion, caused by the number of *Acari* that are adhering to the abdomen and legs. It seems to be *Gamasus marginatus* that chiefly plagues the "dor," or, as certain country folks name it, the "lousy watchman;" from this very circumstance, not "drowsy," I think, as it is oddly stated in some books. I have never discovered these *Acari* upon the beetle in any stage but their adult one, so that their early life is passed elsewhere. The author of the valuable monograph of the British Aptera does not elucidate this portion of their history for us; but it is not likely they are vegetarians even when young.—J. R. S. CLIFFORD; Gravesend, October 3, 1885.

APANTELES GLOMERATUS, *L.*—*Apanteles glomeratus*, the parasite of *Pieris brassicæ*, is common enough; but the following notes, as to the period of its oviposition in its host and the statistics as to its numbers, may interest some entomologists, as they have interested me. On July 14th I sent a friend a batch of young larvæ of *Pieris brassicæ*, some moulting for the first time, others through the moult two or three days. On July 29th I received a letter from him saying that nearly the whole of them had produced parasites (*Apanteles glomeratus*); this rather surprised me, seeing that the larvæ were so young when taken. On September 2nd I was passing the same garden, and observed a batch of forty caterpillars close together, about to change their skins for the first time. I thought this was a good opportunity to verify my friend's statement, consequently the cabbage-leaf with the young larvæ was duly transferred to my breeding-cage; and on the 23rd following I saw that thirty of them had produced parasites (*A. glomeratus*), and ten had changed to pupæ. Thus I was able to confirm his remarks, and am exceedingly glad to have done so, for I must say I was at first rather sceptical over the matter. The parasites averaged about forty-five to each larva. To-day I found in the garden a larva with ninety-nine cocoons of

A. glomeratus under and around it; and I think the greater number may be accounted for by supposing that the parent parasite attacked this larva when further advanced in growth, and consequently stronger and better able to support them. It seems curious that a larva some four mm. in length should have about fifty eggs of its enemy lodged in it.—G. C. BIGNELL Stonehouse, September 24, 1885.

MICROPLITIS OCELLATÆ, *Bouché*.—Mr. Charles Fenn very kindly sent me a *Smerinthus populi* larva, from which sixty-two *Microplitis ocellatæ* had issued. This, I believe, is the greatest number yet noted of this species from its victim.—G. C. BIGNELL.

THE MIGRATION OF APHIDES.—Probably at no place in the country were the swarms of migrating Aphides more dense this year than at Emsworth, in Hampshire. In such profusion were these insects that they seriously interfered with the traffic in the streets. They seem especially to have beset the Post-office, making it difficult for the officials to conduct their business, their noses, eyes, and ears being almost filled with them.—JOSEPH ANDERSON, jun.; Chichester; November, 1885.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The Annual Exhibition of Insects in Pocket-boxes, held by this Society, occurred on Thursday, November 12th, and was very successful, a large number of members and visitors being present. The exhibits were fairly numerous and interesting; among others were those of the following:—Mr. Thornthwaite, fine *Sphinx convolvuli*, and a very perfect specimen of *Chœrocampa celerio* from Lynmouth, Devonshire, with many other insects in fine condition. Mr. H. Jobson, fine *Plusia chryson* (*orichalcea*), and a series each of *Erastria venustula*, *Bankia argentula*, and others. Mr. E. Cooke, a fine series of *Acronycta alni*, varieties of *Arctia villica*, having the spots on the anterior wings confluent, and a nice series of *Eupœcilia curvistrigana*. Mr. Franklin, life-histories of several species; but the best exhibit of this kind was Mr. Pearson's case, containing twelve species, all most carefully worked out and arranged, the ichneumons being included. Mr. Anderson showed two boxes containing preserved larvæ. Mr. Gray, of Redhill, some recently captured specimens. Mr. Russell, a fine "IVI" variety of *Setina irrorella*, a peculiar sandy yellow form of *Melanippe fluctuata*, and others. Mr. Huckett confined himself to one species, showing a graduated series of varieties of *Abraxas grossulariata*. Mr. Harper, varieties of *Spilosoma lubricipeda*, *Eugonia quercinaria* (*angularia*), *Moma orion*, *Lælia cœnosa*, *Cleora angularia* (*viduaria*), &c. Mr. J. A. Clark, a specimen of *C. celerio*, captured in Hackney; also varieties of female *Lycæna corydon*, and a living specimen of *Acherontia atropos*. Mr. J. A. Cooper, series each of bred *Zonosoma orbicularia*, *Z. porata*, and *Pericallia syringaria*. Mr. Gates, light and dwarf varieties of *Arctia caia*. Mr. Gurney, a beautiful dark suffused specimen of the same species. Mr. Allbuary, confluent var. of *A. villica*, *Scoria lineata* (*dealbata*), *Cnæmidophorus rhododactylus*, and *Ocneria dispar*, taken this year at Bexley Heath. Dr. Sequeira, selection from his Devonshire captures, including some splendid forms, *Hypsipetes elutata*, &c. Mr. Pearson, Coleoptera, comprising *Rhynchites pubescens*, and species of Coccinellidæ. Mr. Cripps, *Donacia menyanthidis* and *D. typhæ*; also female *Athous longicollis*, four species of Coccinellidæ, *Plagiodera armoraciæ*, *Pterostichus lepidus*, &c. Mr. G. A. Lewcock, *Necrophori*, *Donaciæ*, *Saperda carcharias*, *Grammoptera tabacicolor*, *Leptura livida*, *Gymnetron*, *Sibynes*, *Hypna*, *Tanymecus*, *Cleonus nebulosus*, *Bembidia*, &c.; all remarkable for their careful mounting and neatness of arrangement. The visitors made considerable additions to the exhibits. The centre of interest throughout the evening was Mr. B. W. Neave's variety of the under side of a male *Lycæna alexis*, captured on Brighton Downs; this beautiful specimen has a series of long dashes most regularly arranged in place of the usual spots. Mr. Hawes, male *Argynnis paphia* much streaked with black, and bleached forms of *Epinephele ianira*. Mr. Riches, a suffused *Hemerophila abruptaria*, taken at Hornsey Rise. Mr. Adkin, very dark forms of *Dianthœcia capsophila*.—Ernest Anderson, Hon. Sec.; 10, Brownlow Street, Dalston, E.

Natural History Exhibition.—The South London Society will hold its Annual Exhibition, of which entomological subjects will form a large section, at the rooms, 1 Denman Street, adjoining London Bridge Station, on the 3rd inst., at 8 o'clock p.m. These exhibitions deserve the patronage of our readers, and greatly encourage the interest taken in Natural History work generally.—J. T. C.

WEST, NEWMAN AND CO., PRINTERS, HATTON GARDEN, LONDON, E.C.

438 ½ g cus [illegible]

595.705
E6147
v 18
1885

Use a temporary book card.

NON CIRCULATING
DO NOT REMOVE
FROM THE LIBRA